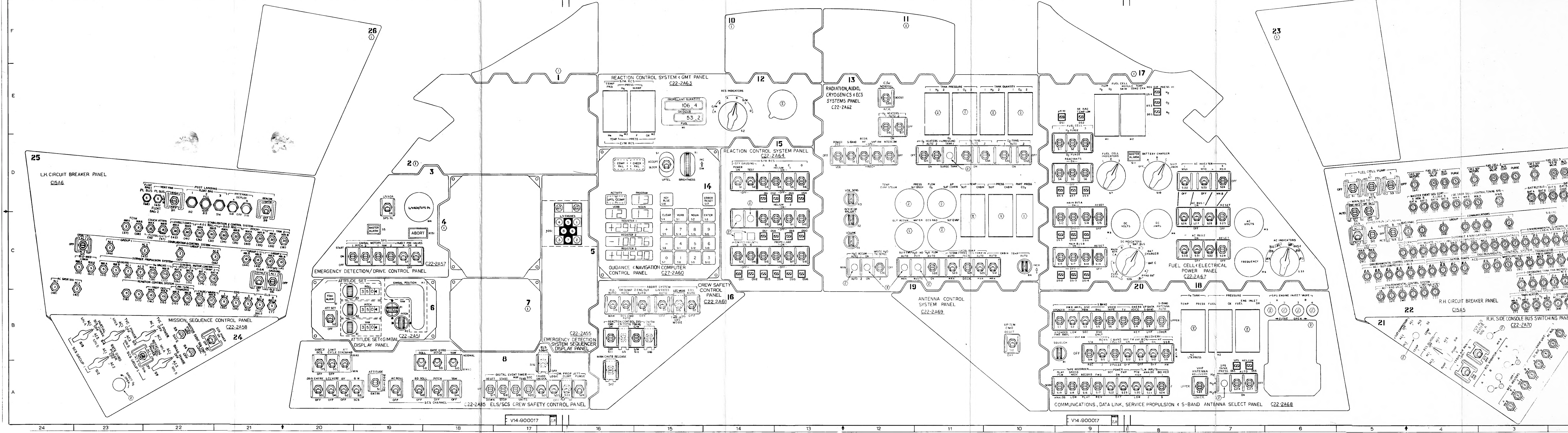


5. DELETED COMPONENTS
4. BLANK PANEL
3. THE NUMERICAL IDENTIFICATION IN THE CENTER OF EACH CIRCUIT BREAKER INDICATES THE AMPERAGE OF EACH BREAKER
2. REFERENCE DESIGNATORS (S, DS, R & C/B NO.) DO NOT ACTUALLY APPEAR ON THE FACE OF THE MAIN DISPLAY CONSOLE PANELS, BUT ARE NORMALLY LOCATED ON THE REVERSE SIDE.
1. CIRCUIT BREAKER NUMBERS ARE IN PARENTHESIS (38) (24) ETC USING ONLY THE NUMERICAL PORTION OF THE DESIGNATOR

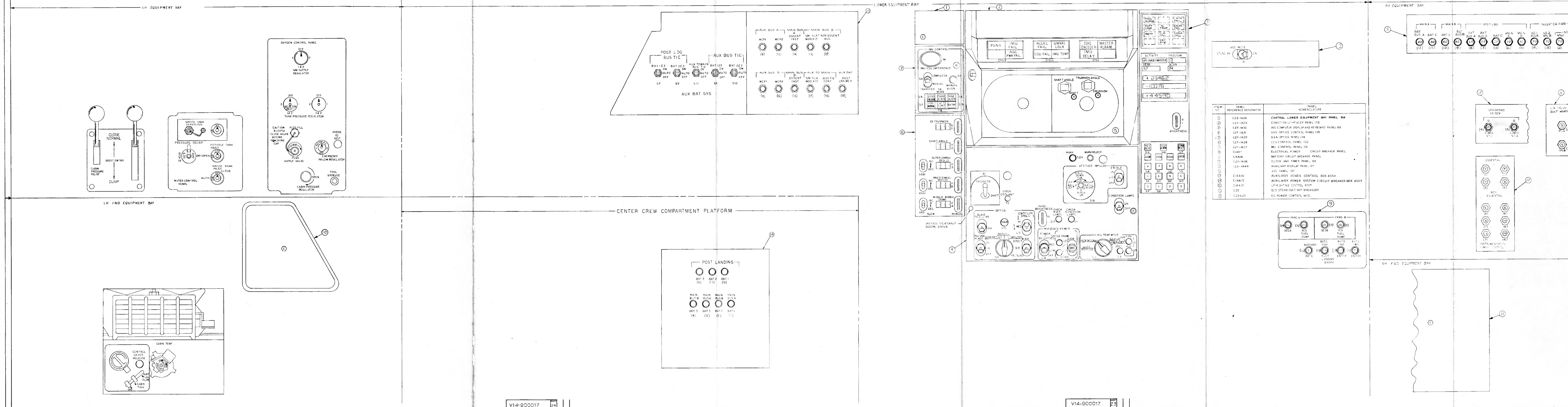
NOTES: UNLESS OTHERWISE SPECIFIED

DR BY	BRENNEMAN	2-3-66
CHK BY	697-406	3881
APPROVED BY		
DAGSHER		
STEVENSON		
SC 017 SC 020	DOWNEY & ETR	

NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION
12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA

CONTROLS & DISPLAYS - MAIN DISPLAY CONSOLE PANELS

CODE IDENT NO	SIZE	
03953	J	V14-900017
SCALE	REV D	SHEET 2,8



ITEM NO	PANEL REFERENCE DESIGNATOR	PANEL NOMENCLATURE
1	C22-1A34	CONTROL LOWER EQUIPMENT BAY PANEL 98
2	C27-1A29	CONDITION LIGHT ASSY PANEL 103
3	C27-1A32	AGC COMPUTOR DISPLAY AND KEYBOARD PANEL 106
4	C27-1A31	G&N OPTICS CONTROL PANEL 105
5	C27-1A30	G&N OPTICS PANEL 104
6	C27-1A28	CDU CONTROL PANEL 102
7	C27-1A27	IMU CONTROL PANEL 101
9	C14A7	ELECTRICAL POWER CIRCUIT BREAKER PANEL
[illegible]	C14A16	BATTERY CIRCUIT BREAKER PANEL
10	C22-1A38	CLOCK AND TIMER PANEL 99
11	C26-4A44	AUXILIARY DISPLAY PANEL 97
12		AGC PANEL 107
13	C14A14	AUXILIARY POWER CONTROL BOX ASSY
14	C14A15	AUXILIARY POWER SYSTEM CIRCUIT BREAKER BOX ASSY
15	C14A13	UP-RIGHTING CONTROL ASSY
16	C23	ECS STEAM DUCT HRT BREAKERS
17	C28A25	DC POWER CONTROL MOD.

⟨1⟩ 3. BLANK PANELS
2. THE NUMERICAL IDENTIFICATION OF THE CENTER OF EACH CIRCUIT BREAKER INDICATES THE AMPERAGE OF EACH BREAKER CIRCUIT BREAKER NUMBERS ARE IN PARENTHESIS (38) (24) ETC USING ONLY THE NUMERICAL PORTION OF THE DESIGNATORS

NOTES UNLESS OTHERWISE SPECIFIED

A 2

DR BY BRENNEMAN	2-14-66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD. DOWNEY CALIFORNIA	
CHK BY 697-406	3881	CONTROL & DISPLAYS LOWER EQUIPMENT BAY PANELS	
APPROVED BY			
M. STEVENSON			
SC 017 SC 020	DOWNEY & ETR	CODE IDENT NO 03953	SIZE J — V14-900017
SCALE	REV D	SHEET 2 9	

V14-900017 D

NOTES: UNLESS OTHERWISE SPECIFIED

1. CIRCUIT BREAKER NUMBERS ARE IN PARENTHESIS (38) (24) ETC USING ONLY THE NUMERICAL PORTION OF THE DESIGNATOR
2. REFERENCE DESIGNATORS (S, DS, R & C/B NO.) DO NOT ACTUALLY APPEAR ON THE FACE OF THE MAIN DISPLAY CONSOLE PANELS, BUT ARE NORMALLY LOCATED ON THE REVERSE SIDE.
3. THE NUMERICAL IDENTIFICATION IN THE CENTER OF EACH CIRCUIT BREAKER INDICATES THE AMPERAGE OF EACH BREAKER
4. (1) BLANK PANEL
5. (2) DELETED COMPONENTS

A1

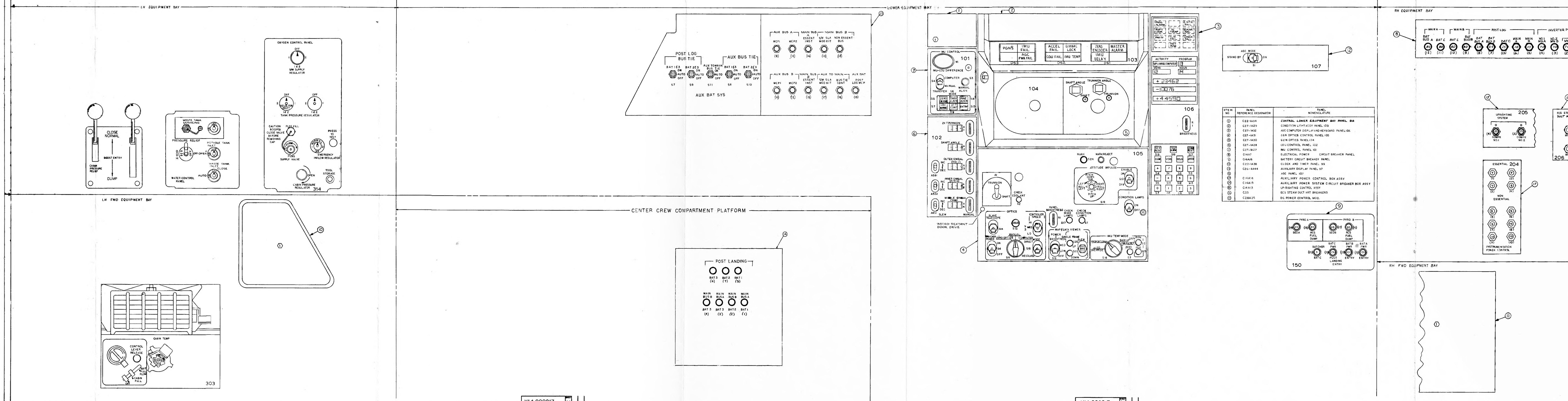
DR BY	BRENNEMAN	2-3-66
CHK BY	697-406	3881
APPROVED BY		
DAGSHER		
STEVENSON		
SC 017 SC 020	DOWNEY & ETR	

NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION
12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA

CONTROLS & DISPLAYS - MAIN DISPLAY CONSOLE PANELS

CODE IDENT NO 03953 | SIZE J | V14-900017

SCALE | SHEET 2



ITEM NO.	PANEL REFERENCE DESIGNATOR	PANEL NOMENCLATURE
1	C22-1A34	CONTROL LOWER EQUIPMENT BAY PANEL 98
2	C27-1A29	CONDITION LIGHT ASSY PANEL 103
3	C27-1A32	AGC COMPUTOR DISPLAY AND KEYBOARD PANEL 106
4	C27-1A31	G&N OPTICS CONTROL PANEL 105
5	C27-1A30	G&N OPTICS PANEL 104
6	C27-1A28	CDU CONTROL PANEL 102
7	C27-1A27	IMU CONTROL PANEL 101
8	C14A7	ELECTRICAL POWER CIRCUIT BREAKER PANEL
9	C14A16	BATTERY CIRCUIT BREAKER PANEL
10	C22-1A38	CLOCK AND TIMER PANEL 99
11	C26-4A44	AUXILIARY DISPLAY PANEL 97
12		AGC PANEL 107
13	C14A14	AUXILIARY POWER CONTROL BOX ASSY
14	C14A15	AUXILIARY POWER SYSTEM CIRCUIT BREAKER BOX ASSY
15	C14A13	UP-RIGHTING CONTROL ASSY
16	C23	ECS STEAM DUCT HRT BREAKERS
17	C28A25	DC POWER CONTROL MOD.

(1) 3. BLANK PANELS

2. THE NUMERICAL IDENTIFICATION OF THE CENTER OF EACH CIRCUIT BREAKER INDICATES THE AMPERAGE OF EACH BREAKER

1. CIRCUIT BREAKER NUMBERS ARE IN PARENTHESIS (38) (24) ETC USING ONLY THE NUMERICAL PORTION OF THE DESIGNATORS

NOTES: UNLESS OTHERWISE SPECIFIED

A 2

DR BY	HUMPHREY	2-14-66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA
CHK BY	697-406	3881	CONTROL & DISPLAYS LOWER EQUIRMENT BAY PANELS
APPROVED BY			
DAGSHER	3-22-66		
W. STEVENSON	3-22-66		
SC 017 SC 020	DOWNEY & ETR		CODE IDENT NO 03953 — SIZE J — V14-900017
			SCALE — REV E — SHEET 2.9

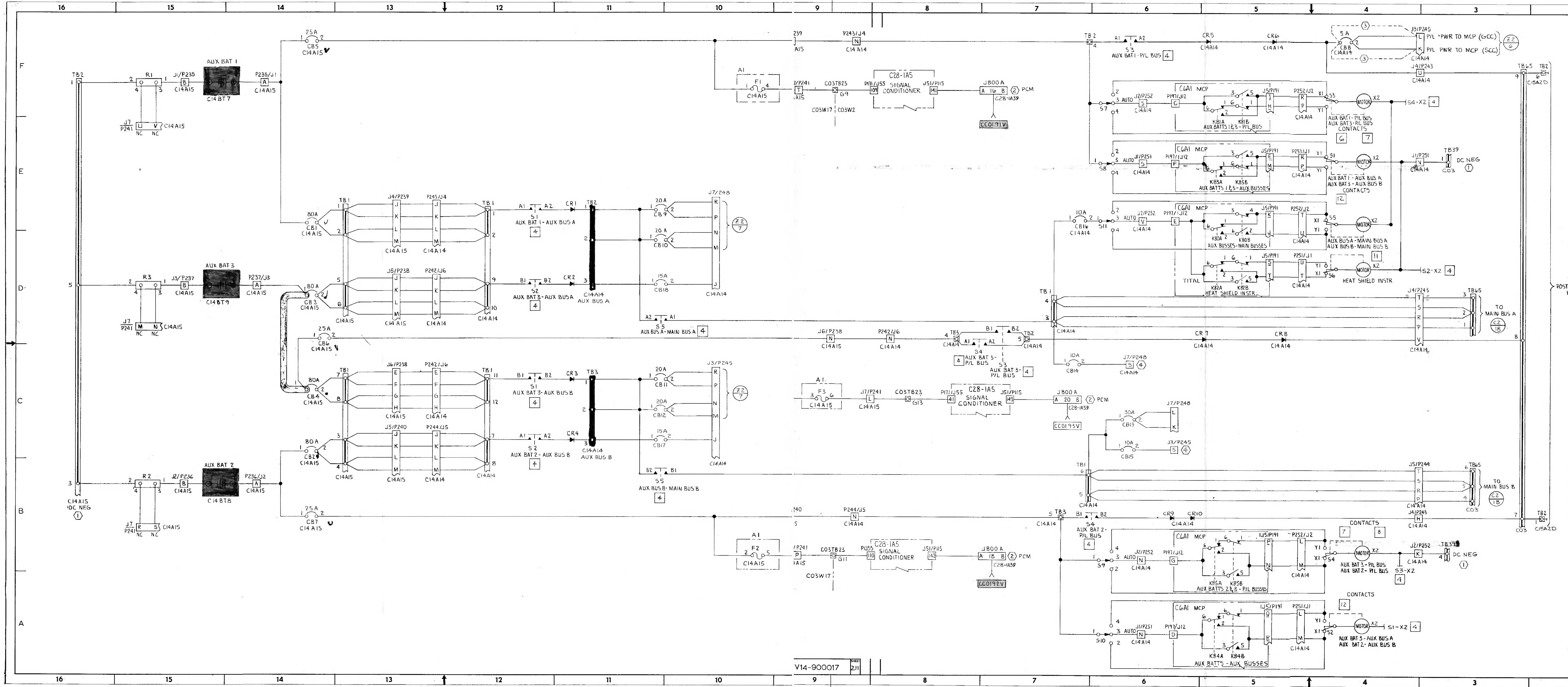
NOTES: UNLESS OTHERWISE SPECIFIED

1. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS, SEE INDICES
2. (1) FOR CONTINUATION OF GSE CIRCUITS, SEE G14-900017, VOL 1.
3. (2) FOR CONTINUATION OF DC GROUNDING SEE C7
4. (3) FOR CONTINUATION OF INSTRUMENTATION SEE V14-900017, VOL 3.
5. (4) FOR CONTINUATION OF CIRCUIT SEE C7
6. (5) FOR CONTINUATION OF CIRCUIT SEE C11
7. (6) FOR CONTINUATION OF CIRCUIT SEE C8
8. (7) FOR CONTINUATION OF CIRCUIT SEE C4
9. (8) FOR CONTINUATION OF CIRCUIT SEE C3 ZONE 2
10. (9) CIRCUIT BREAKER TO BE BY-PASSED IN THE FIELD.

C2

DR BY	2-3-66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA	
CHK BY 697-406	3881		
APPROVED BY		EPS - DC PWR DISTR	
T. HOGARD	3-10-66		
STEVENSON	3-22-6		
		CODE IDENT NO 03953	SIZE J
SC017 SC020	DOWNEY & ETR	SCALE	REV D

V14-900017 SHEET 2.10



4. 5. FOR CONTINUATION OF CIRCUIT SEE M2 V14-900017 VOL 3
3. 4. CIRCUIT BREAKER TO BE BY-PASSED IN THE FIELD.
2. 3. FOR CONTINUATION OF INSTRUMENTATION SEE V14-900017 - VOL 3
1. 2. FOR CONTINUATION OF DC GROUNDING SEE C7
1. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS, SEE INDICES

NOTES UNLESS OTHERWISE SPECIFIED

C3

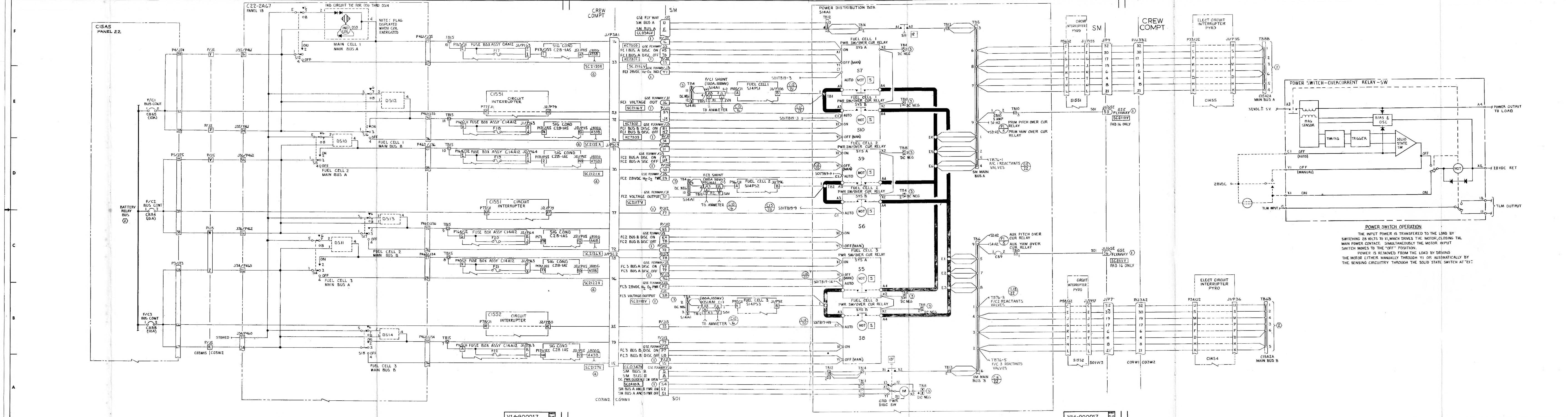
NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION
12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA

EPS - AUXILIARY BATTERY SYSTEM

DR BY BRENNEMAN
T. HOGARD
STEVENSON

CODE IDENT NO 03953 | J | V14-900017

REV D | SHEET 2.11



POWER SWITCH OPERATION

THE INPUT POWER IS TRANSFERED TO THE LOAD BY SWITCHING 28 VOLTS TO X1, WHICH DRIVES THE MOTOR, CLOSING THE MAIN POWER CONTACT. SIMULTANEOUSLY THE MOTOR INPUT SWITCH MOVES TO THE "OFF" POSITION.

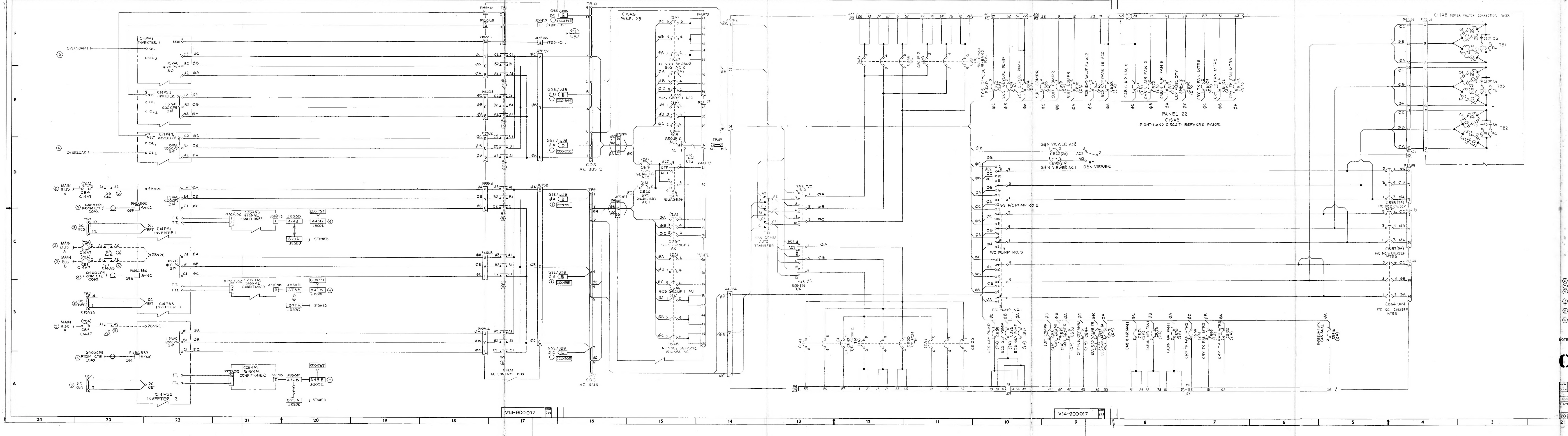
POWER IS REMOVED FROM THE LOAD BY DRIVING THE MOTOR EITHER MANUALLY THROUGH Y1 OR AUTOMATICALLY BY THE SENSING CIRCUITRY THROUGH THE SOLID STATE SWITCH AT "C1".

(4) 5. FOR CONTINUATION OF INSTRUMENTATION SEE SEE G14-900017 VOL 3
(3) 4. FOR CONTINUATION OF DC GROUNDING SEE C7
(2) 3. FOR CONTINUATION OF DC POWER SEE C2
(1) 2. FOR CONTINUATION OF GSE CIRCUITS SEE G14-900017 VOL 1
1. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS SEE INDICES
NOTES: UNLESS OTHERWISE SPECIFIED

C4

DR BY	BRENNEMAN	2-1-66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA
CHK BY	697-406	3881	
APPROVED BY			EPS- S/M POWER DISTRIBUTION
T HOGARD		3-10-66	
STEVENSON		3-22-66	
			CODE IDENT NO 03953 / SIZE J / V14-900017
SC017 SC020	DOWNEY & ETR		SCALE / REV D / SHEET 2.12

V14-900017 D

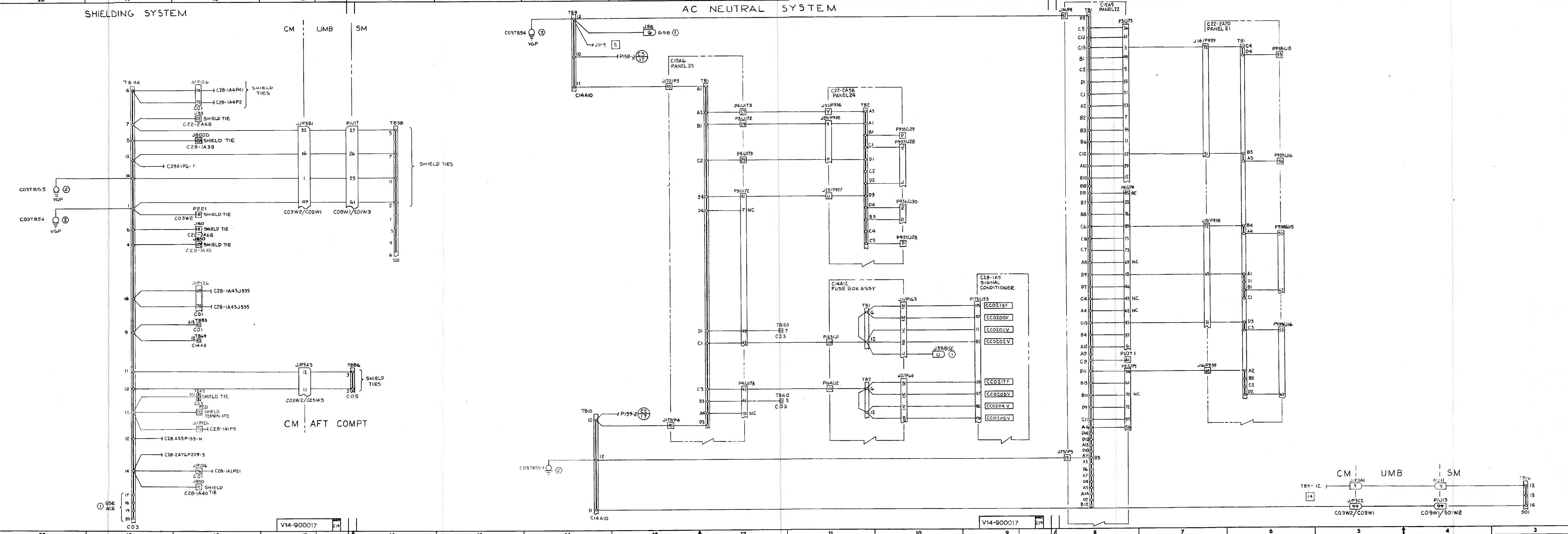


NOTES: UNLESS OTHERWISE SPECIFIED

1. FOR CONTINUATION OF ALL SWITCHING DEVICES AND RELATED CIRCUITS, SEE INDICES
2. (1) FOR CONTINUATION OF GSE CIRCUITS, SEE G14-900017 VOL 1
3. (2) FOR CONTINUATION OF D C POWER, SEE C2
4. (3) FOR CONTINUATION OF DC GROUNDING, SEE C7
5. (4) FOR CONTINUATION OF INSTRUMENTATION, SEE V14-900017 VOL 3
6. (5) FOR CONTINUATION OF CIRCUITRY SEE C8
7. (6) FOR CONTINUATION OF CIRCUITRY SEE C9

C5

DR BY BRENNEMAN 6-4-66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD, DOWNEY, CALIFORNIA	
CHK BY 697-406 3881	EPS-AC POWER DISTRIBUTION	
APPROVED BY T. HOGARD; STEVENSON	CODE IDENT NO 03953	SIZE J — V14-900017
SC017 SC020 DOWNEY & ETR	SCALE	REV D — SHEET 2.13



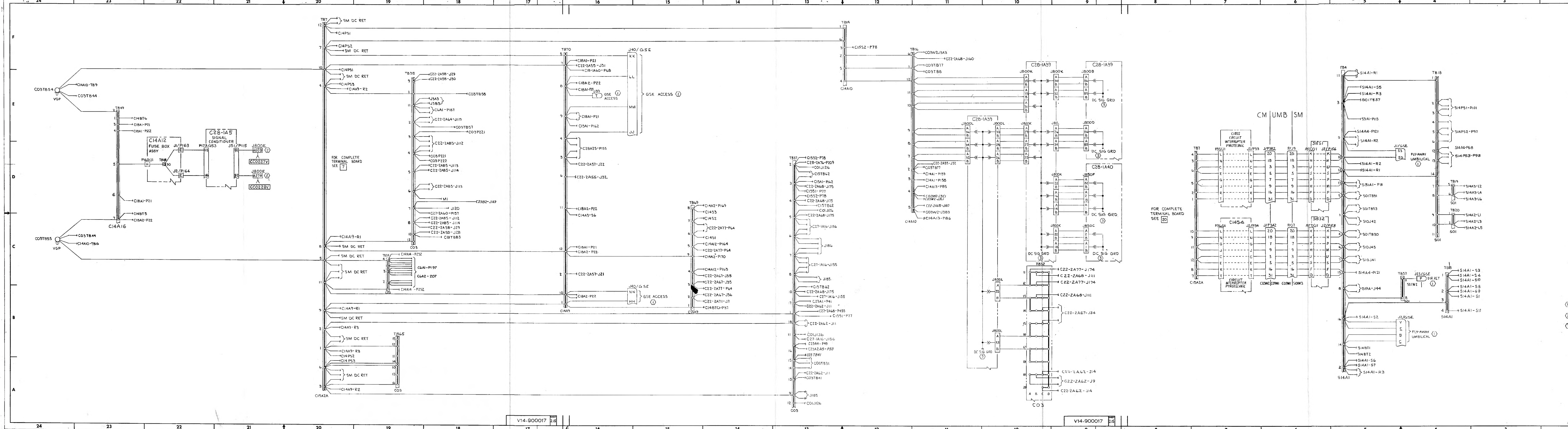
NOTES: UNLESS OTHERWISE SPECIFIED

1. FOR CONTINUATION OF ALL SWITCHING DEVICES AND RELATED CIRCUTS, SEE INDICIES
2. (1) FOR CONTINUATION OF GSE CIRCUITS, SEE G14-900017 VOL I
3. (2) FOR CONTINUATION OF CIRCUIT, SEE C7

C6

DR BY BRENNEMAN 2-4-66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA	
CHK BY 697-406 3881	EPS GROUNDING SHIELD RETURNS & AC NEUTRAL	
APPROVED BY T HOGARD		
STEVENSON		
SC017 SC020 DOWNEY & ETR	CODE IDENT NO 03953 SIZE J	V14-900017
	SCALE REV D	SHEET 2.14

V14-900017 D



3 4 ALL PINS BUSSED TOGETHER WITH AN INTERNAL CIRCUIT BOARD

2 3 FOR CONTINUATION OF INSTURMENTION SEE V14-900017, VOL. 3

1 2 FOR CONTINUATION OF GSE CIRCUITS, SEE G14-900017, VOL. 1

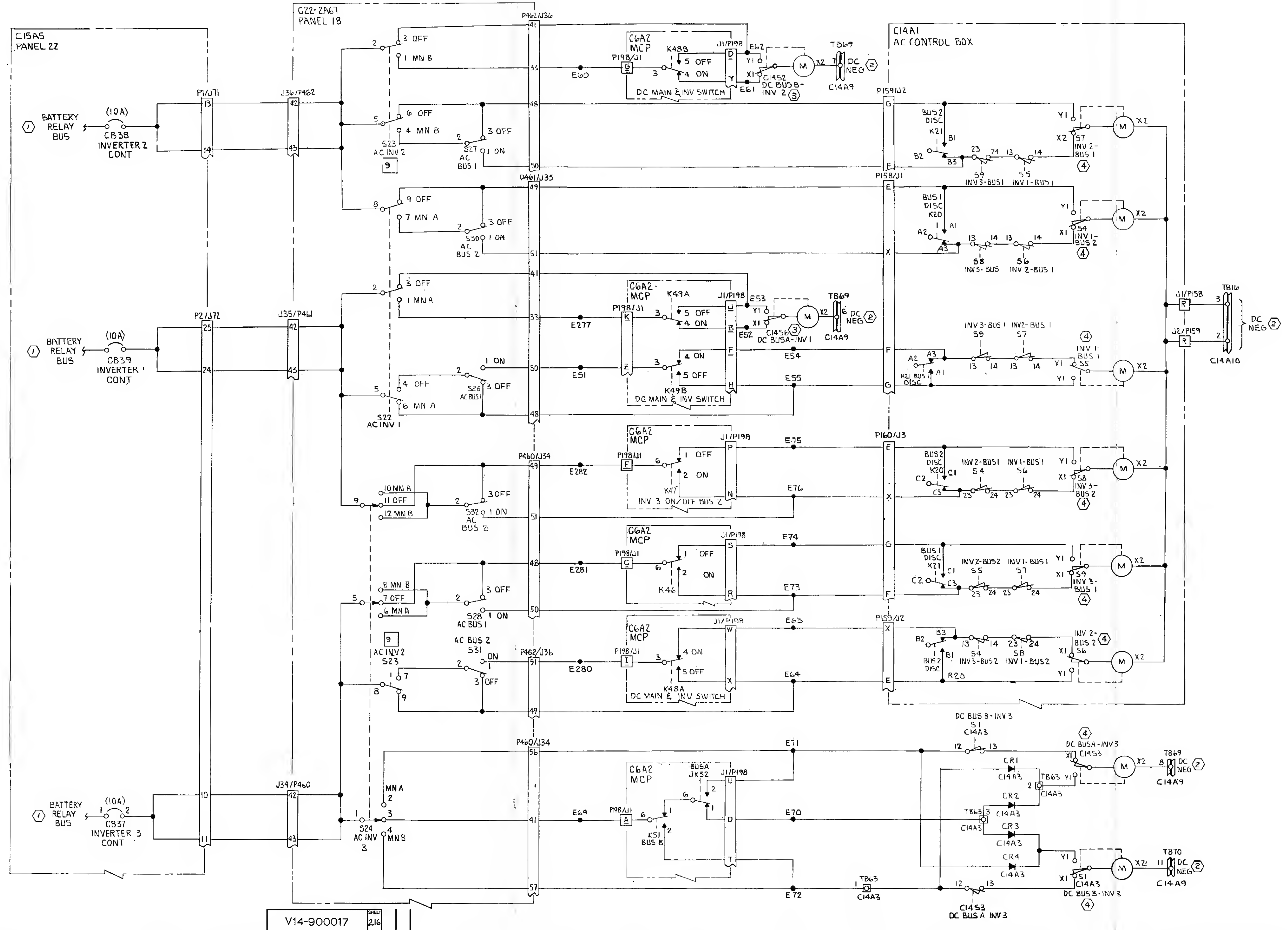
1. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS SEE INDICIES

NOTES: UNLESS OTHERWISE SPECIFIED

C7

DR BY	BRENNEMAN	2-2-66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA
CHK BY	697-406	3881	EPS-GROUNDING, DC RETURNS
APPROVED BY			
T. HOGARD	3-10-66		
STEVENSON	3-22-6		
			CODE IDENT NO 03953 · SIZE J · V14-900017
SC017 SC020	DOWNEY & ETR		SCALE · REV D · SHEET 2.15

V14-900017 D

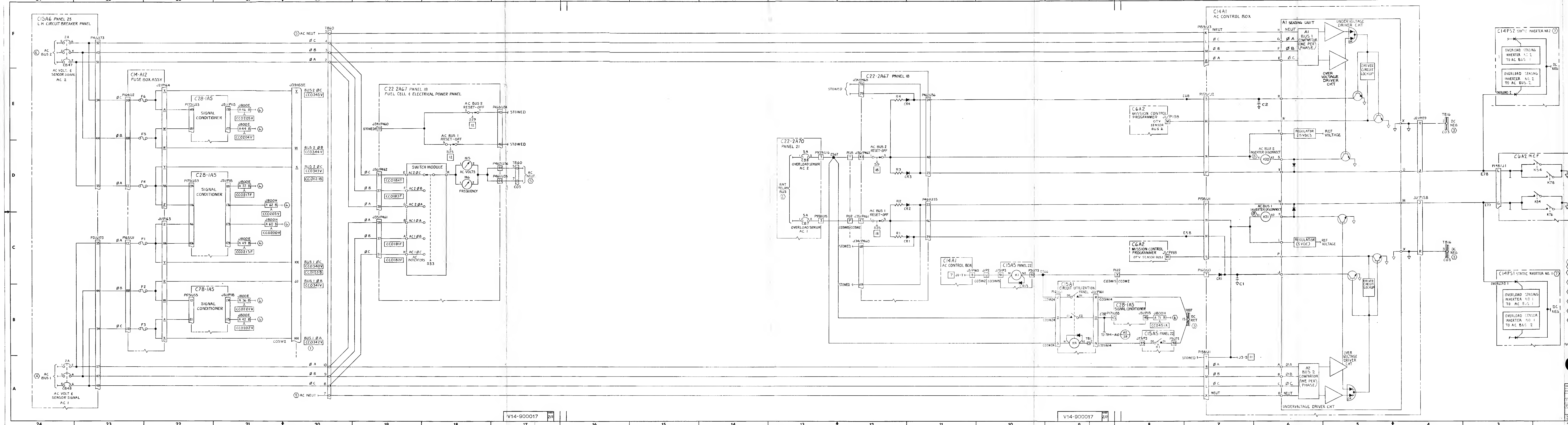


NOTES: UNLESS OTHERWISE SPECIFIED

1. FOR CONTINUATION OF ALL SWITCHING DEVICES AND RELATED CIRCUITS, SEE INDICES
2. ⟨1⟩ FOR CONTINUATION OF D C POWER, SEE C2
3. ⟨2⟩ FOR CONTINUATION OF D C GROUNDING, SEE C7
4. ⟨3⟩ FOR CONTINUATION OF CIRCUIT, SEE C2
5. ⟨4⟩ FOR CONTINUATION OF CIRCUIT, SEE C5

C8

DR BY	BRENNEMAN	2-7-66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA
CHK BY	697-406	3881	
APPROVED BY			EPS-AC INVERTER CHANGE OVER
T. HOGARD		3-10-66	
STEVENSON		3-22-6	
SC 017 SC 020	DOWNEY & ETR		CODE IDENT NO 03953 · SIZE J · V14-900017
			SCALE · REV D · SHEET 2.16

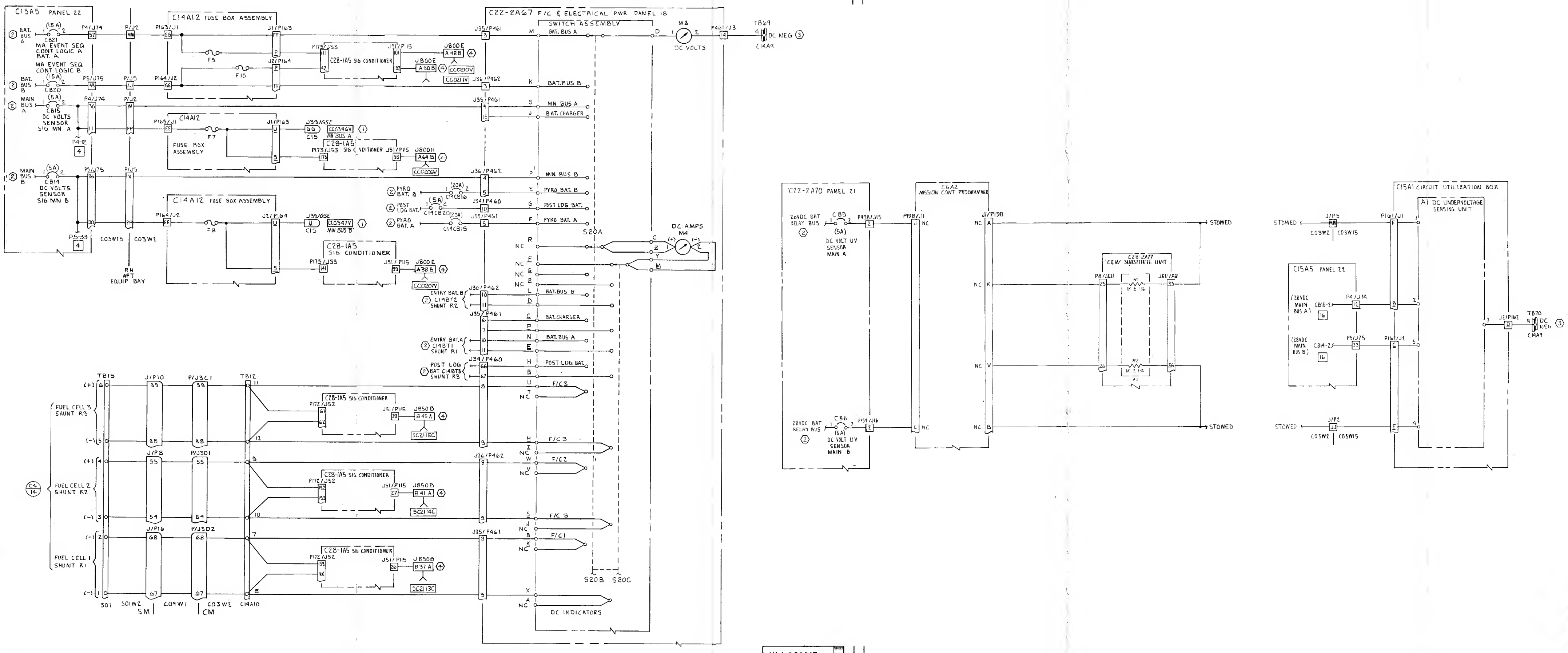


⑧ 9. FOR CONTACTS, SEE C6
⑦ 8. FOR CONTINUATION OF CIRCUITS, SEE C5
⑥ 7. FOR CONTINUATION OF INSTRUMENTATION, SEE V14-900017 VOL 3
⑤ 6. FOR CONTINUATION OF AC GROUNDING, SEE C6
④ 5. FOR CONTINUATION OF AC POWER, SEE C5
③ 4. FOR CONTINUATION OF DC GROUNDING, SEE C7
② 3. FOR CONTINUATION OF DC POWER, SEE C2
① 2. FOR CONTINUATION OF GSE CIRCUITS, SEE G14-900017 VOL 1
1. FOR CONTINUATION OF ALL SWITCHING DEVICES AND RELATED CIRCUTS, SEE INDICES

NOTES: UNLESS OTHERWISE SPECIFIED

C9

DR BY	JIM ELLIS	214 66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD DOWNEY CALIFORNIA
CHK BY	697406	3881	
APPROVED BY			EPS-AC SENSING & MONITORING
T HOGARD	3 10 66		
STEVENSON			
SC017 SC020	DOWNEY & ETR		CODE IDENT NO 03953 · SIZE J · V14-900017
			SCALE · REV D · SHEET 2.17



④ 5 FOR CONTINUATION OF INSTRUMENTATION SEE V14-900017, VOL 3

③ 4 FOR CONTINUATION OF DC GROUNDING SEE C7

② 3 FOR CONTINUATION OF DC POWER SEE C2

① 2 FOR CONTINUATION OF GSE CIRCUITS, SEE G14-900017, VOL 1

1. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS, SEE INDICES

NOTES UNLESS OTHERWISE SPECIFIED

C10

DR BY	FLEISCHER	2-9-66
CHK BY	697-406	3881
APPROVED BY		
T. HOGARD	TH	3-10-66
STEVENSON	MEJ	3-22-6
SC017 SC020	DOWNEY & ETR	

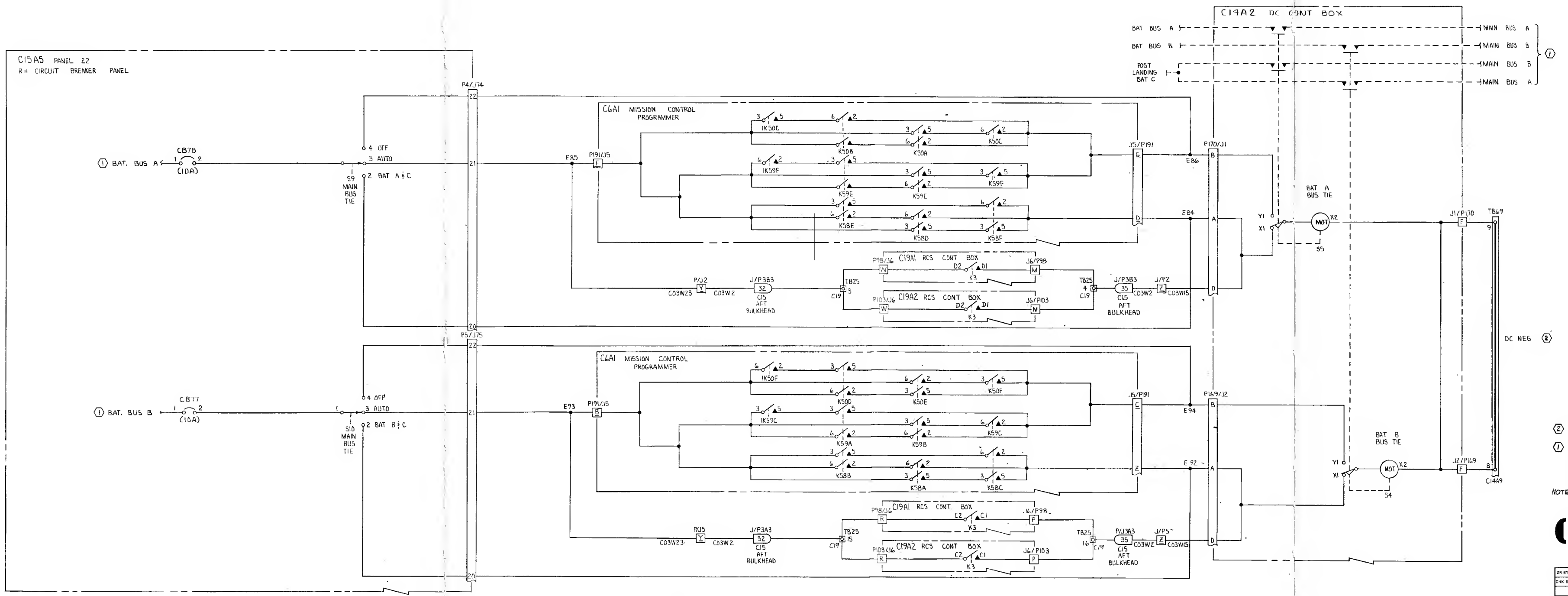
NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION
12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA

EPS– DC SENSING & MONITORING

CODE IDENT NO 03953 | SIZE J | V14-900017

SCALE | REV D | SHEET 2.18

V14-900017 | 2.18



2. 3. FOR CONTINUATION OF DC GROUNDING, SEE C7

1. 2. FOR CONTINUATION OF DC POWER, SEE C2

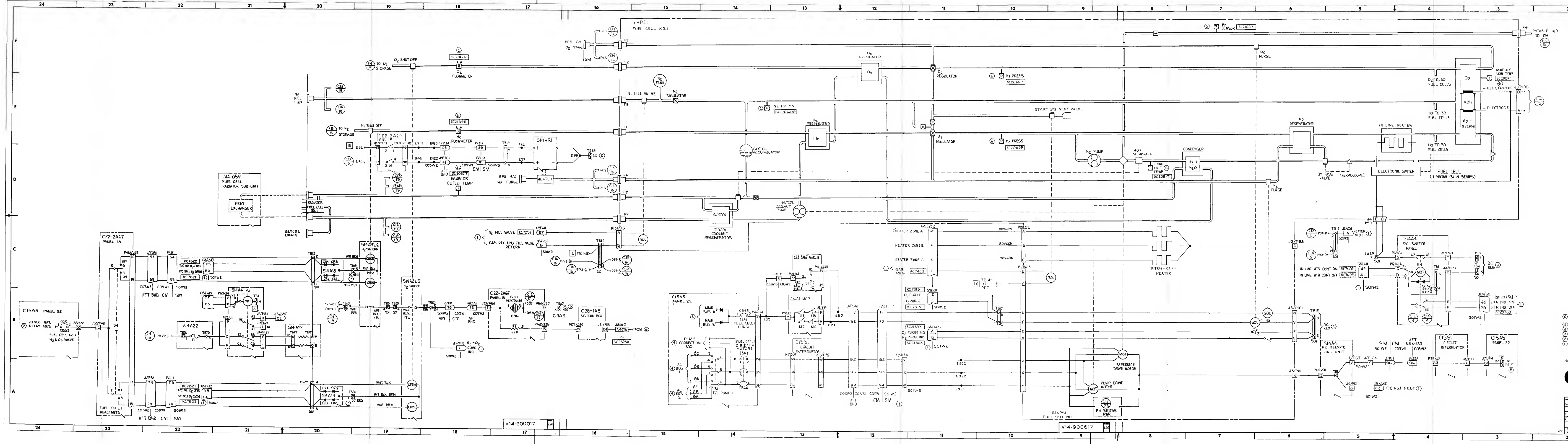
1. FOR CONTINUATION OF ALL SWITCHING DEVICES AND RELATED CIRCUTS, SEE INDICIES

NOTES: UNLESS OTHERWISE SPECIFIED

C11

DR BY	R.A. LONG	2/15/66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD. DOWNEY, CALIFORNIA
CHK BY	697-406	3881	
APPROVED BY			EPS–BUS TIE CONTROL
T HOGARD	3-10-66		
STEVENSON	MES 2-22-66		
SC017 SC020	DOWNEY & ETR		CODE IDENT NO 03953 · SIZE J · V14-900017
			SCALE · REV D · SHEET 2.15

V14-900017 · SHEET 2.15

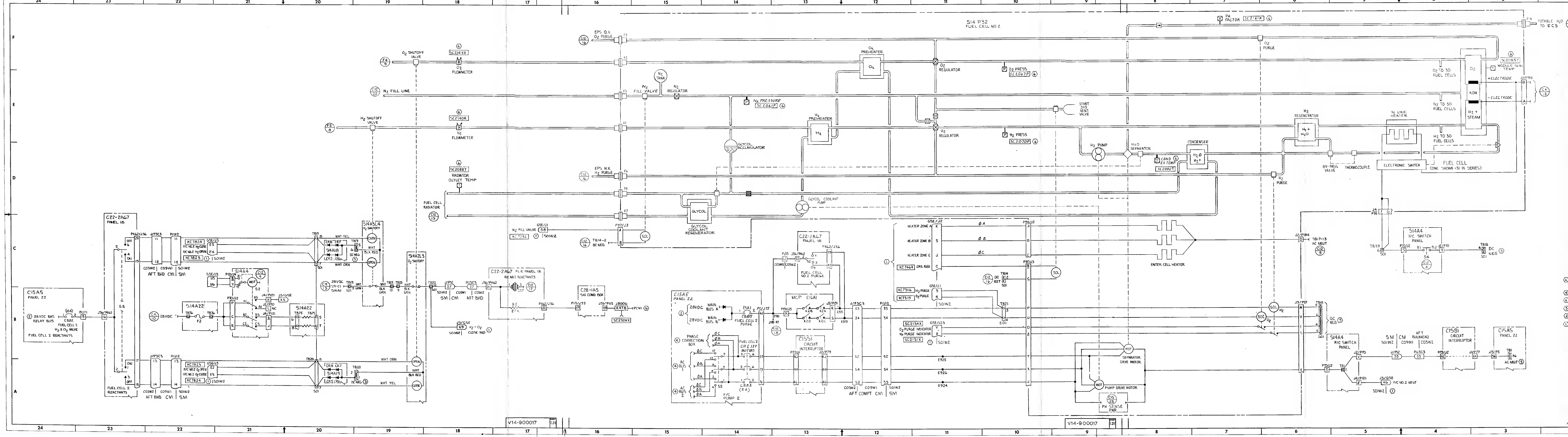


⑥ 7. FOR CONTINUATION OF INSTRUMENTATION SEE V14-900017 VOL 3
⑤ 6. FOR CONTINUATION OF AC GROUNDING SEE C6
④ 5. FOR CONTINUATION OF AC POWER SEE C5
③ 4. FOR CONTINUATION OF DC GROUNDING SEE C7
② 3. FOR CONTINUATION OF DC POWER SEE C2
① 2. FOR CONTINUATION OF GSE CIRCUITS SEE G14-900017 VOL 1
1. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS SEE INDICES

NOTES: UNLESS OTHERWISE SPECIFIED

C12

DR BY	BRENNEMAN	2 8 66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD. DOWNEY CALIFORNIA
CHK BY	697 406	3881	
APPROVED BY			FUEL CELL SYSTEM, NO.1
T HOGARD			
STEVENSON			
SC017 SC020	DOWNEY & ETR		CODE IDENT NO 03953 · SIZE J · V14-900017
			SCALE · REV D · SHEET 2.20



(6) 7 FOR CONTINUATION OF INSTRUMENTATION SEE V14-900017, VOL 3

(5) 6 FOR CONTINUATION OF AC GROUNDING SEE C6

(4) 5 FOR CONTINUATION OF AC POWER SEE C5

(3) 4 FOR CONTINUATION OF DC GROUNDING SEE C7

(2) 3 FOR CONTINUATION OF DC POWER SEE C2

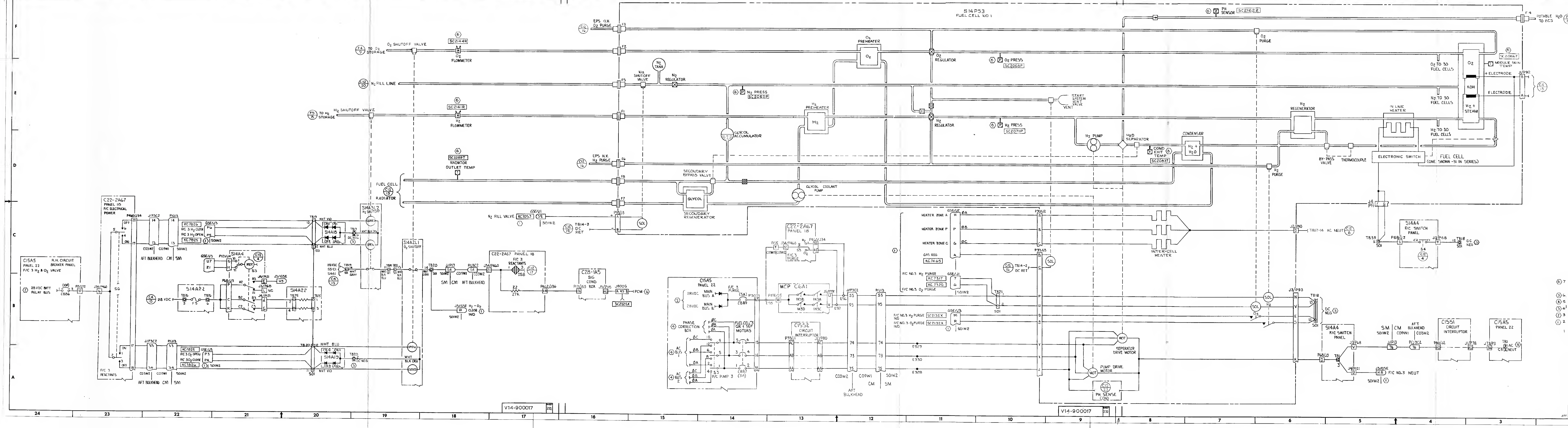
(1) 2 FOR CONTINUATION OF GSE CIRCUITS, SEE G14-900017. VOL 1

1 FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS, SEE INDICES.

NOTES UNLESS OTHERWISE SPECIFIED

C13

DR BY	LEWIS	9-20-65	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD DOWNEY CALIFORNIA
CHK BY	697-406	3881	
APPROVED BY			FUEL CELL SYSTEM NO 2
T HOGARD	3-10-66		
STEVENSON	[illegible]		
SC017 SC020	DOWNEY & ETR		CODE IDENT NO 03953 · SIZE J · V14-900017
			SCALE · REV D · SHEET 2.21

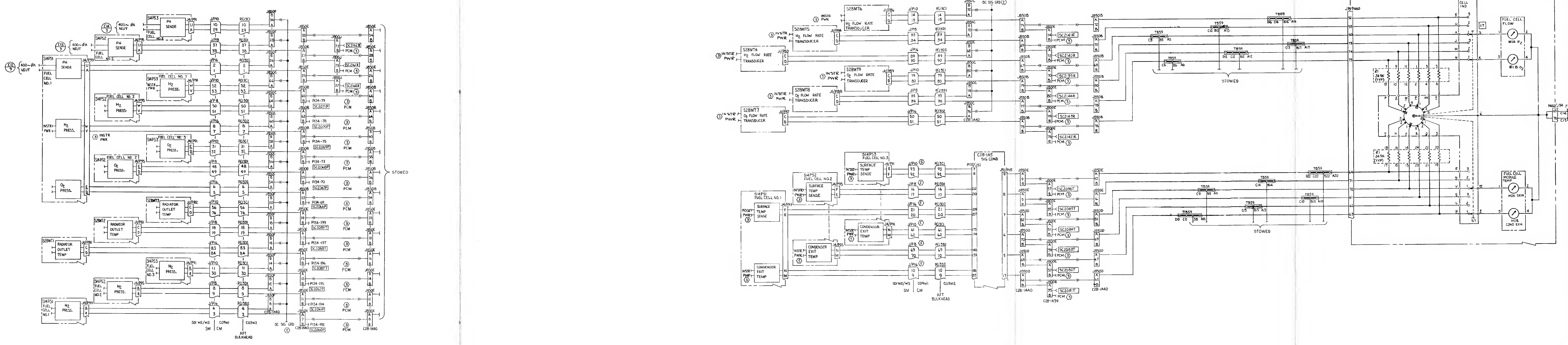


(6) 7 FOR CONTINUATION OF INSTRUMENTATION SEE V14-900017 VOLUME 3
(5) 6 FOR CONTINUATION OF AC GROUNDING SEE C6
(4) 5. FOR CONTINUATION OF AC POWER SEE C5
(3) 4 FOR CONTINUATION OF DC GROUNDING SEE C7
(2) 3 FOR CONTINUATION OF DC POWER SEE C2
(1) 2 FOR CONTINUATION OF GSE, SEE G14-900017, VOL 1
1 FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS, SEE INDICES

NOTES: UNLESS OTHERWISE SPECIFIED

C14

DR BY	JIM ELLIS	6-9-64	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD. DOWNEY CALIFORNIA
CHK BY	697-406	3881	
APPROVED BY			FUEL CELL SYSTEM NO. 3
T. HOGARD			
STEVENSON			
SC017 SC020	DOWNEY & ETR		CODE IDENT NO 03953 · SIZE J · V14-900017
			SCALE · REV D · SHEET 2.22



③ 4 FOR CONTINUATION OF INSTRUMENTATION SEE V14-900017, VOL 3

② 3 FOR CONTINUATION OF DC GROUNDING SEE C7

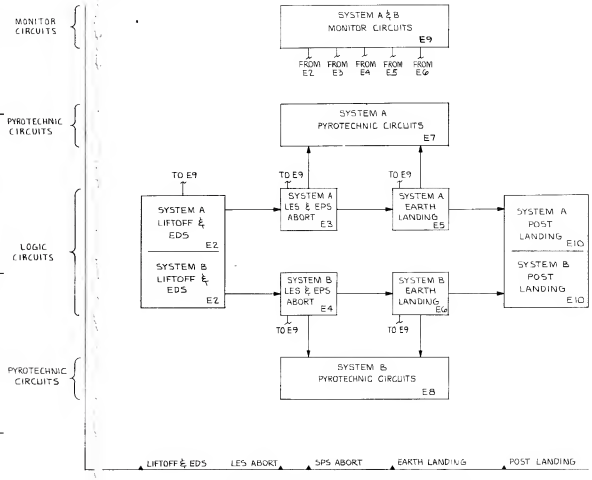
① 2 FOR CONTINUATION OF DC POWER, SEE C2

1 FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS, SEE INDICES

NOTES UNLESS OTHERWISE SPECIFIED

C15

DR BY	RA LONG	2-3-66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD. DOWNEY CALIFORNIA
CHK BY	697-406	3881	MONITOR SYSTEM — GAS DISTRIBUTION
APPROVED BY			
T. HOGARD	3-10-66		
STEVENSON	3-22-6		CODE IDENT NO 03953 · SIZE J · V14-900017
SC017 SC020	DOWNEY & ETR		SCALE · REV. D · SHEET 2.23



FLOW OF FUNCTIONAL INTEGRATED SYSTEMS SCHEMATICS SEQUENTIAL EVENTS CONTROL SUBSYSTEM

SECS REFERENCE DESIGNATORS

C6A1 MISSION CONTROL PROGRAMMER (MCP)
C6A2 MISSION CONTROL PROGRAMMER (MCP)
C18A1 MASTER EVENTS SEQUENCE CONTROLLER (MESC) SYSTEM A
C18A2 MASTER EVENTS SEQUENCE CONTROLLER (MESC) SYSTEM B
C19A1 REACTION CONTROL SUBSYSTEM CONTROLLER (RCSC) SYSTEM A
C19A2 REACTION CONTROL SUBSYSTEM CONTROLLER (RCSC) SYSTEM B
C20A1 EARTH LANDING SEQUENCE CONTROLLER (ELSC) SYSTEM A
C20A2 EARTH LANDING SEQUENCE CONTROLLER (ELSC) SYSTEM B
C20A4 PYRO CONTINUITY VERIFICATION BOX (PCVB)
S19A7 SM JETTISON CONTROLLER (SMJC) SYSTEM A
S19A8 SM JETTISON CONTROLLER (SMJC) SYSTEM B

E1

DR BY SPRINGER 12766
CHK BY 697-406 3881
APPROVED BY
G HOFFMAN 3-11-6
STEVENSON 3-22-66

NORTH AMERICAN AVIATION, INC
SPACE and INFORMATION SYSTEMS DIVISION
12214 LAKEWOOD BLVD DOWNEY CALIFORNIA

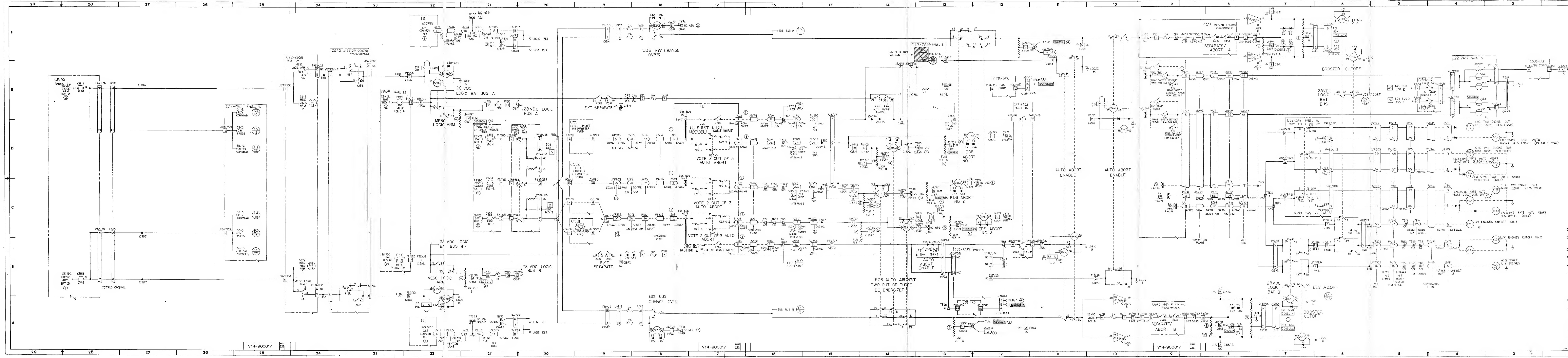
FLOW DIAGRAM AND REFERENCE DESIGNATOR

CODE IDENT NO 03953 | SIZE J | V14-900017

SC017 SC020 DOWNEY & ETR

SCALE | REV D | SHEET 2 24

V14-900017 D



E2

NOTES: UNLESS OTHERWISE SPECIFIED

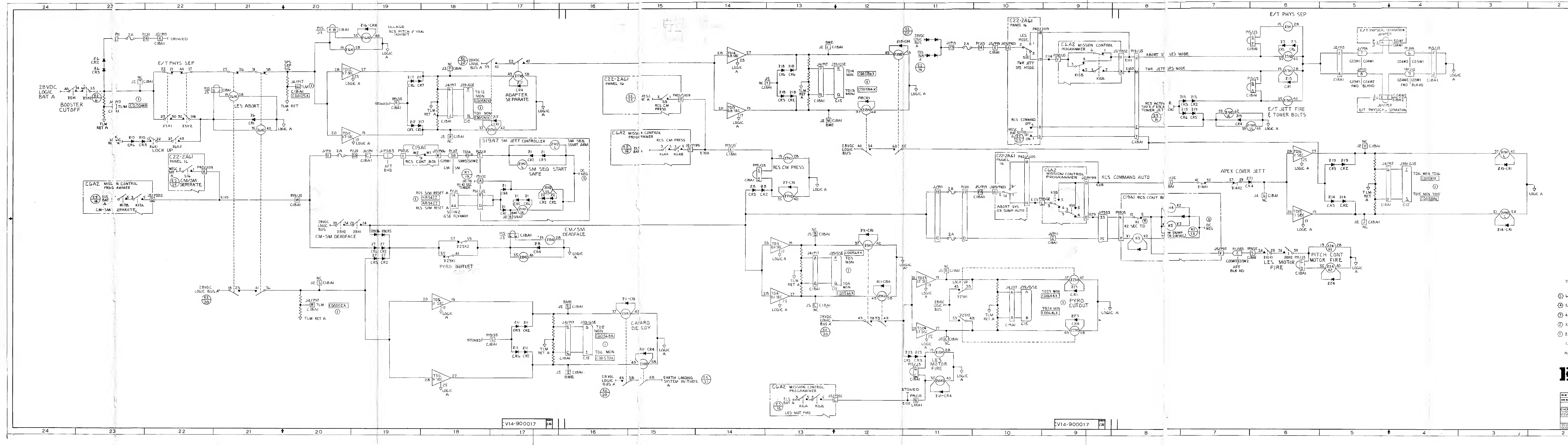
1. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS SEE INDICE
2. FOR CONTINUATION OF GSE CIRCUITS SEE G14-900017 VOL I ⟨1⟩
3. FOR CONTINUATION OF DC POWER SEE EPS (SECTION C2) ⟨2⟩
4. FOR CONTINUATION OF DC GROUNDING SEE EPS (SECTION C7) ⟨3⟩
5. FOR CONTINUATION OF INSTRUMENTATION SEE V14-900017 VOL 3 ⟨4⟩
6. TLM SIGNAL & GSE EVENT MONITOR SIGNALS ARE SCALED 37 TO 8.88 VOLTS NOMINAL ⟨5⟩
7. ANALOG SIGNALS ARE SCALED 37 TO 4.74 VOLTS NOMINAL ⟨6⟩

DR BY	R.A. LONG	2-2-66
CHK BY	697-406	3881
APPROVED BY		
G. HOFFMAN	3-11-6[illegible]	
STEVENSON	MES 3-22-66	
SC017 SC020	DOWNEY & ETR	

NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION
12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA

SECS - EDS & ABORT CIRCUITS - SYSTEMS A & B

CODE IDENT NO	SIZE	
03953	J	V14-900017
SCALE	REV D	SHEET 2.25



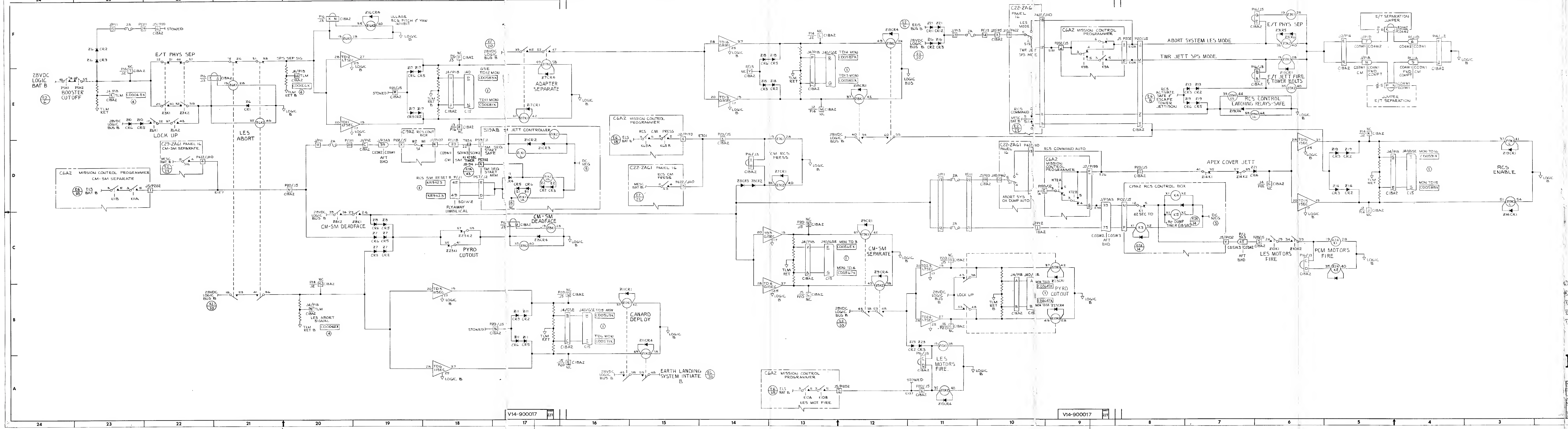
7. TLM SIGNALS & GSE EVENT MONITOR SIGNALS ARE SCALED 37 TO 8.88 VOLTS NOMINAL
(5) 6. FOR CONTINUATION OF CIRCUIT SEE RCS (SECTION R7)
(4) 5. FOR CONTINUATION OF INSTRUMENTATION SEE SEE V14-900017 VOL. 3
(3) 4. FOR CONTINUATION OF DC GROUNDING SEE EPS (SECTION C7)
(2) 3. FOR CONTINUATION OF DC POWER SEE EPS (SECTION L2)
(1) 2. FOR CONTINUATION OF GSE CIRCUITS SEE G14-900017 VOL I
1. FOR CONTINUATION OF ALL SWITCHING DIVICES & RELATED CIRCUITS, SEE INDICES

NOTES: UNLESS OTHERWISE SPECIFIED

E3

DR BY	BRENNEMAN	12-21-65	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD. DOWNEY, CALIFORNIA
CHK BY	697-406	3881	SECS - LES & SPS ABORT SYSTEM A
APPROVED BY			
G HOFFMAN	3-11-6		
STEVENSON	3-22-66		
SC017 DOWNEY SC020 & ETR			CODE IDENT NO 03953 · SIZE J · V14-900017
			SCALE · REV D · SHEET 2.26

V14-900017 D



7 TLM SIGNALS & GSE EVENT MONITOR ARE SCALED TO 37 TO 8.88 VOLTS NOMINAL

⟨5⟩ 6 FOR CONTINUATION OF CIRCUIT SEE RCS (SECTION R7A)

⟨4⟩ 5. FOR CONTINUATION OF INSTRUMENTATION SEE V14-900017 VOL 3

⟨3⟩ 4 FOR CONTINUATION OF DC GROUNDING SEE EPS (SECTION C7)

⟨2⟩ 3. FOR CONTINUATION OF DC POWER SEE EPS (SECTION C2)

⟨1⟩ 2. FOR CONTINUATION OF GSE CIRCUITS SEE G14-900017 VOL 1

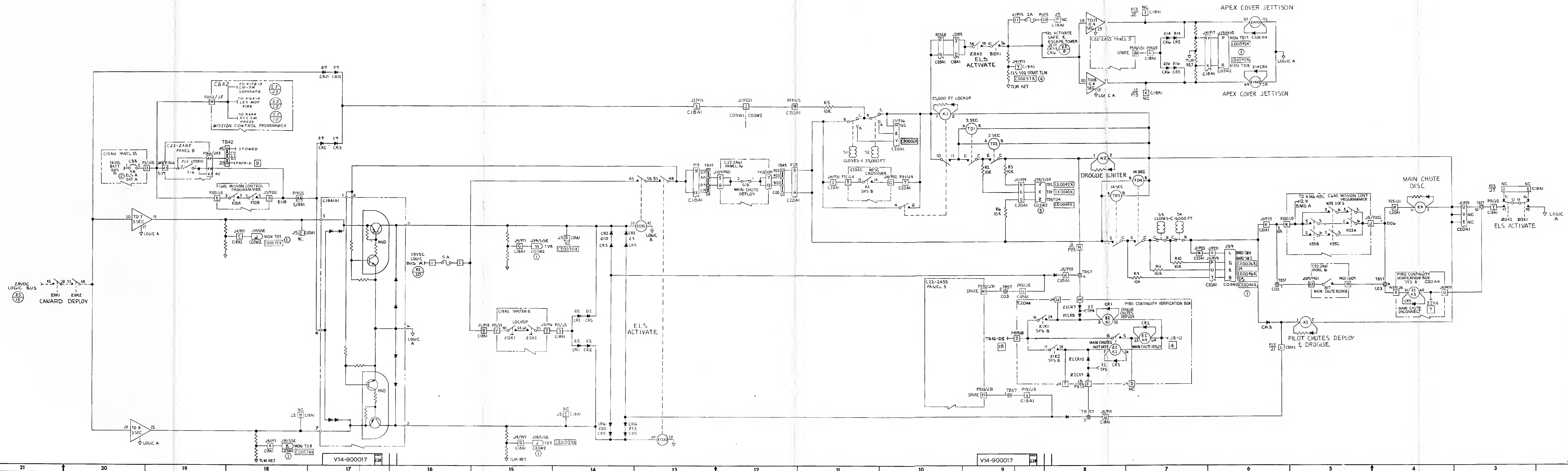
1. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS SEE INDICES

NOTES: UNLESS OTHERWISE SPECIFIED

E4

DR BY BRENNEMAN 1/25/66		NORTH AMERICAN AVIATION, INC SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD. DOWNEY CALIFORNIA
CHK BY 697-406	3881	
APPROVED BY		SECS-LES & SPS ABORT SYSTEM B
HOFFMAN	3-11-66	
STEVENSON	3-22-66	
SC017 DOWNEY		CODE IDENT NO 03953 — SIZE J — V14-900017
SC020 & ETR		SCALE — REV D — SHEET 2.27

V14-900017 D



5. TLM SIGNAL & VOLTAGE REF IS SCALED 37 TO 8.88 VOLTS NOMINAL

(3) 4. FOR CONTINUATION OF INSTRUMENTATION SEE V14-900017 VOL 3

(2) 3. FOR CONTINUATION OF DC POWER SEE EPS (SECTION C2)

(1) 2. FOR CONTINUATION OF GSE CIRCUITS SEE G14-900017 VOL 1

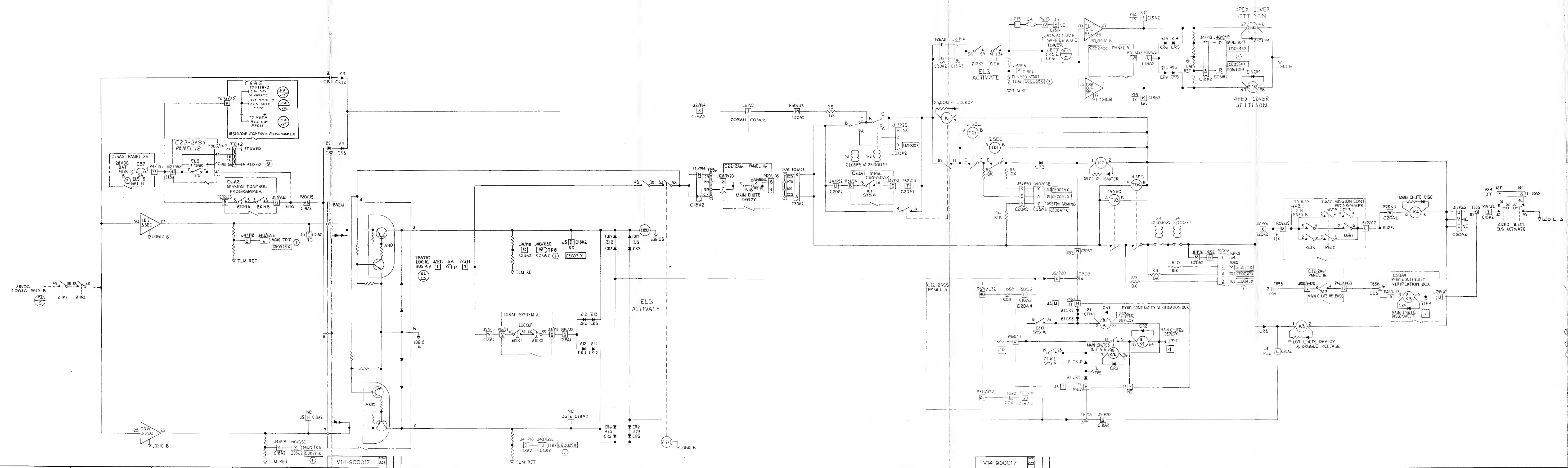
1. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS SEE INDICES

NOTES: UNLESS OTHERWISE SPECIFIED

E5

DR BY	BRENNEMAN	1-26-66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD DOWNEY CALIFORNIA
CHK BY	697-406	3881	SECS- EARTH LANDING SYSTEM A
APPROVED BY			
G. HOFFMAN	3-21-66		
STEVENSON	3-22-66		CODE IDENT NO 03953 · SIZE J · V14-900017
SC017 SC020	DOWNEY & ETR		SCALE · REV D · SHEET 2.28

V14-900017 D



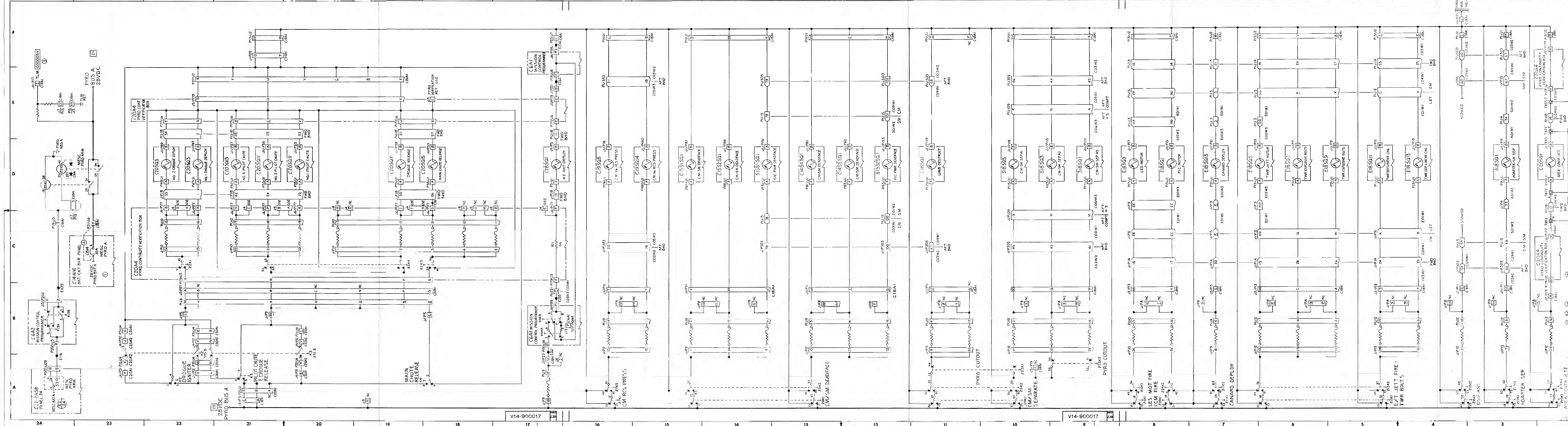
5. TLM SIGNAL & VOLTAGE REF IS SCALED 37 TO 8.88 VOLTS NOMINAL
(3) 4. FOR CONTINUATION OF INSTRUMENTATION SEE V14-900017 VOL 3
(2) 3. FOR CONTINUATION OF DC POWER SEE EPS(SECTION C2)
(1) 2. FOR CONTINUATION OF GSE CIRCUITS SEE G14-900017 VOL 1
1. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS SEE INDICES

NOTE: UNLESS OTHERWISE SPECIFIED

E6

DR BY	BRENNEMAN	1-26-66	NORTH AMERICAN AVIATION, INC SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD DOWNEY CALIFORNIA
CHK BY	697-406	3881	
APPROVED BY			SECS- EARTH LANDING SYSTEM B
G.HOFFMAN	3-6-66		
STEVENSON			
			CODE IDENT NO 03953 — SIZE J — V14-900017
SC017 SC020	DOWNEY & ETR		SCALE — REV D — SHEET 2.29

V14-900017 D



④ 7. CIRCUIT BREAKER TO BE BY-PASSED IN THE FIELD.

6. ALL FUSE RESISTORS ARE 1 OHM

5. TLM SIGNAL & GSE EVENT MONITOR SIGNALS ARE SCALED 37 TO 8.88 VOLTS NOMINAL

③ 4. FOR CONTINUATION OF INSTRUMENTATION SEE V14-900017 VOL 3

② 3. FOR CONTINUATION OF DC GROUNDING SEE EPS (SECTION C7)

① 2. FOR CONTINUATION OF DC POWER SEE EPS (SECTION C2)

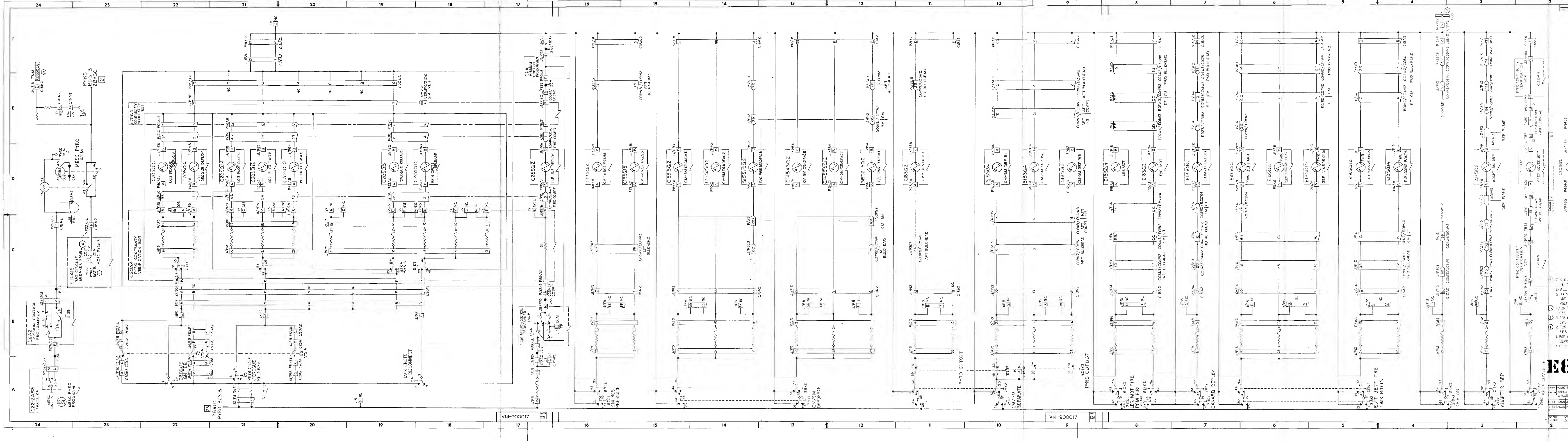
1. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS SEE INDICES

NOTES: UNLESS OTHERWISE SPECIFIED

E7

DR BY	JIM ELLIS	1-31-66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA
CHK BY	697-406	3881	
APPROVED BY			SECS-PYROTECHNIC CIRCUITS-SYSTEM A
G. HOFFMAN	3-11-6		
STEVENSON	3-22-66		
SC017 SC020	DOWNEY & ETR		CODE IDENT NO 03953 · SIZE J · V14-900017
			SCALE · REV D · SHEET 2.30

V14-900017 D

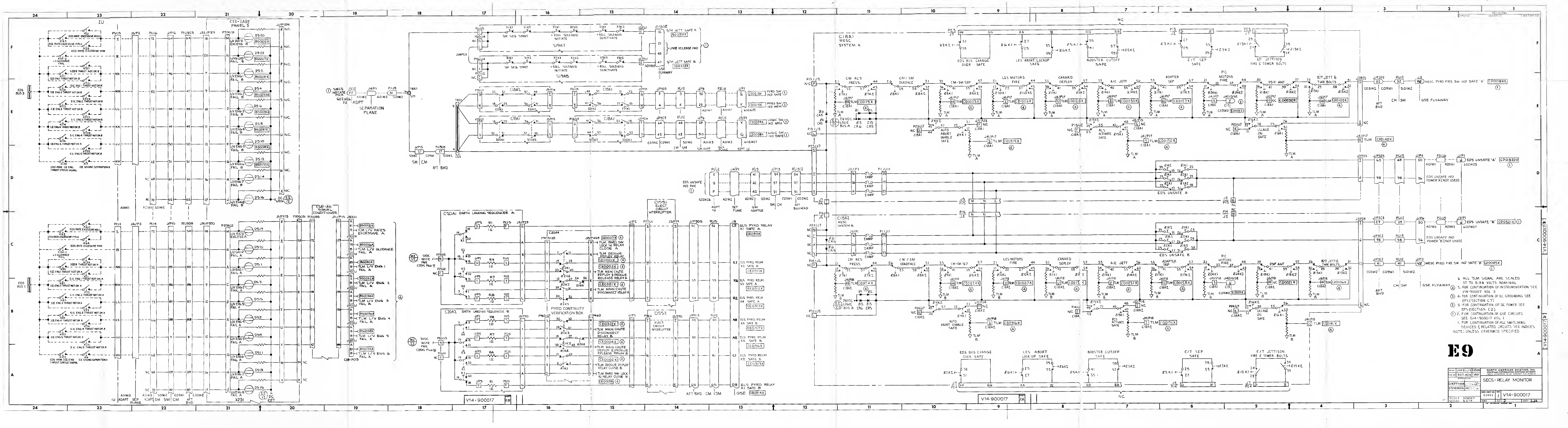


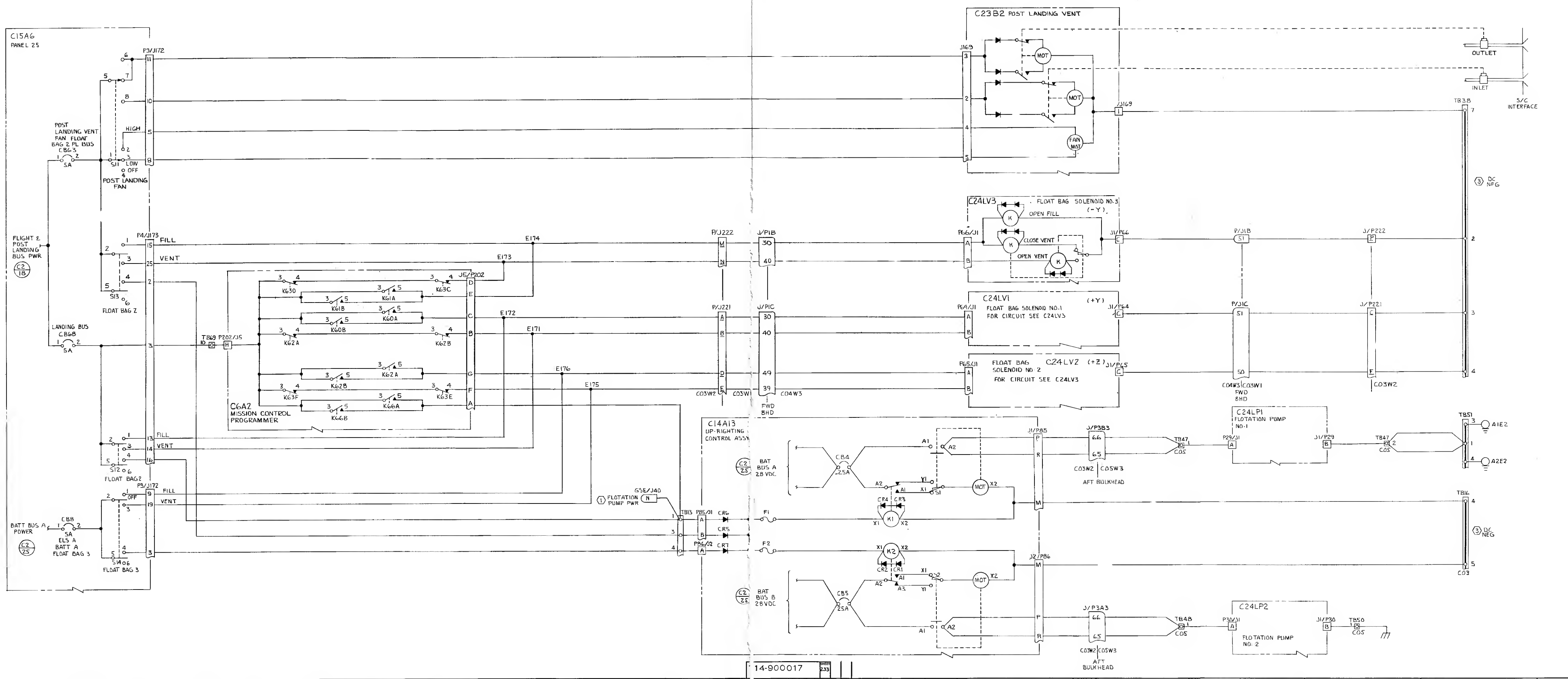
4. 7 CIRCUIT BREAKER TO BE BY-PASSED IN THE FIELD.
6. ALL FUSE RESISTORS ARE 1 OHM
5. TLM SIGNAL & GSE EVENT MONITOR SIGNALS ARE SCALED 37 TO 8.88 VOLTS NOMINAL
3. 4. FOR CONTINUATION OF INSTRUMENTATION SEE V14-900017 VOL 3
2. 3. FOR CONTINUATION OF DC GROUNDING SEE EPS (SECTION C7)
1. 2. FOR CONTINUATION OF DC POWER SEE EPS (SECTION C2)
1. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS SEE INDICES

NOTES: UNLESS OTHERWISE SPECIFIED

E8

DR BY	HOSTETTER	3-11-66	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD DOWNEY CALIFORNIA
CHK BY	697-406	3881	
APPROVED BY			SECS- PYROTECHNIC CIRCUITS SYSTEM B
G. HOFFMAN	3-11-66		
STEVENSON	3-22-66		
SC 017 SC 020	DOWNEY & ETR		CODE IDENT NO 03953 / SIZE J / V14-900017
			SCALE / REV D / SHEET 2.31


SECS - RELAY MONITOR
E9
NOTE: UNLESS OTHERWISE SPECIFIED
1. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS SEE INDICES
2. FOR CONTINUATION OF GSE CIRCUITS SEE G14-900017 VOL 1
3. FOR CONTINUATION OF DC POWER SEE EPS (SECTION C2)
4. FOR CONTINUATION OF DC GROUNDING SEE EPS (SECTION C7)
5. FOR CONTINUATION OF INSTRUMENTATION SEE V14-900017 VOL 3
6 ALL TLM SIGNAL ARE SCALED 37 TO 8.88 VOLTS NOMINAL
MESC PYRO FIRE SW IND SAFE 'B' CD0085X
GSE FLYAWAY
EDS UNSAFE A
EDS UNSAFE B
C18A1 MESC SYSTEM A
C18A2 MESC SYSTEM B
C20A1 EARTH LANDING SEQUENCER A
C20A2 EARTH LANDING SEQUENCER B
PYRO CONTINUITY VERIFICATION BOX
SEPARATION PLANE
DR BY JIM ELLIS 1-25-66
CHK BY 697-406 3881
APPROVED BY
G.HOFFMAN
STEVENSON
SC017 DOWNEY
SC020 & ETR
NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION
12214 LAKEWOOD BLVD DOWNEY CALIFORNIA
CODE IDENT NO 03953
SIZE J
V14-900017
SCALE
REV D
SHEET 2.32



3. 4. FOR CONTINUATION OF DC GROUNDING SEE EPS (SECTION C7)
2. 3. FOR CONTINUATION OF DC POWER SEE EPS (SECTION C2)
1. 2. FOR CONTINUATION OF GSE CIRCUITS SEE G14-900017 VOL. I
1. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS SEE INDICES
NOTES: UNLESS OTHERWISE SPECIFIED

E10

NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION

SECS-POST LANDING SYS A&B

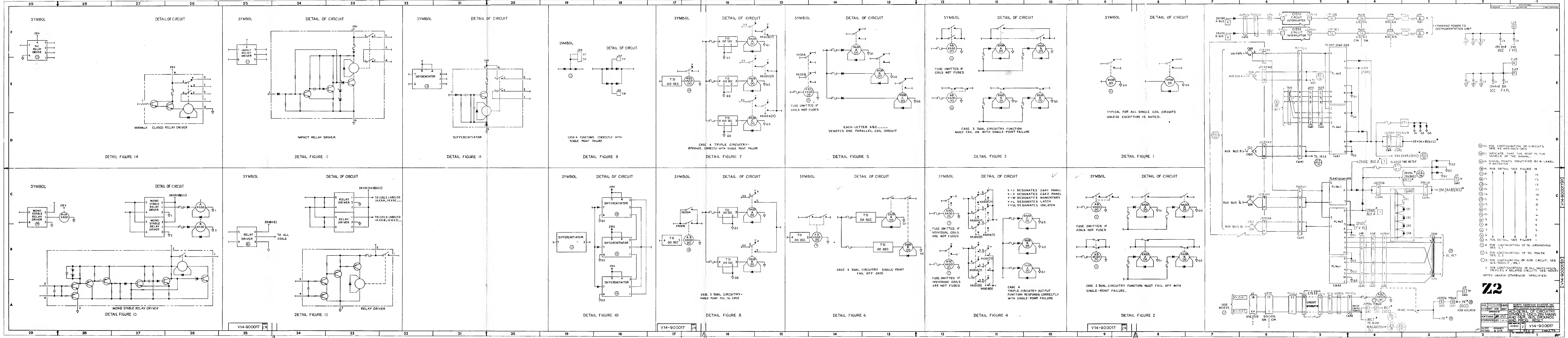
DR BY BRENNEMAN
CHK BY
APPROVED BY HOFFMAN
STEVENSON

SC017 DOWNEY
SC020 & ETR

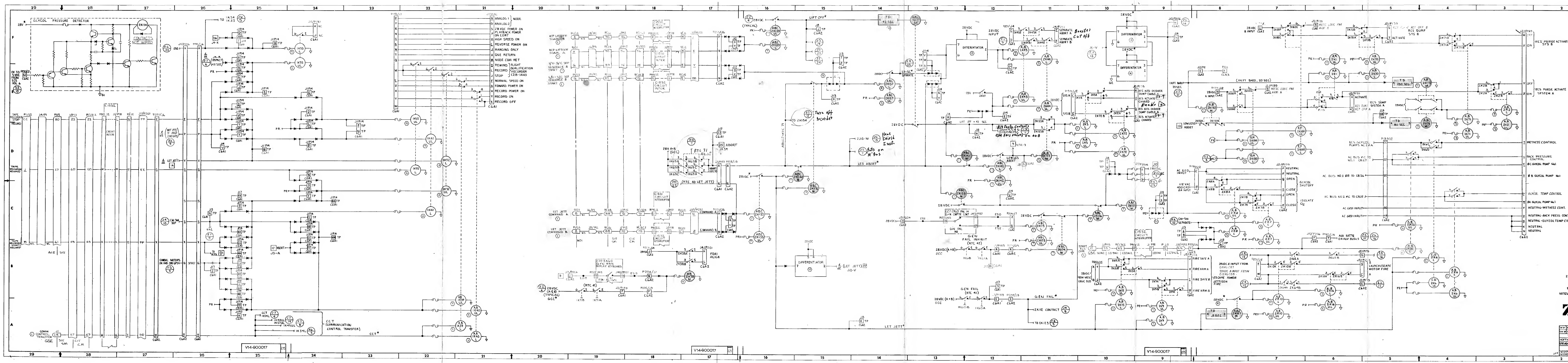
CODE IDENT NO 03953 | SIZE J | V14-900017

REV D | SHEET 2.33

14-900017 | 2.33



DETAIL FIGURE 14
NORMALLY CLOSED RELAY DRIVER
DETAIL FIGURE 12
IMPACT RELAY DRIVER
DETAIL FIGURE 11
DIFFERENTIATOR
DETAIL FIGURE 9
CASE 4 FUNCTIONS CORRECTLY WITH SINGLE POINT FAILURE
DETAIL FIGURE 7
CASE 4 TRIPLE CIRCUITRY-RESPONDS CORRECTLY WITH SINGLE POINT FAILURE
DETAIL FIGURE 5
EACH LETTER A,B,C.... DENOTES ONE PARALLEL COIL CIRCUIT
FUSE OMITTED IF COILS NOT FUSED
DETAIL FIGURE 3
CASE 3 DUAL CIRCUITRY FUNCTION MUST FAIL ON WITH SINGLE POINT FAILURE
DETAIL FIGURE 1
TYPICAL FOR ALL SINGLE COIL CIRCUITS UNLESS EXCEPTION IS NOTED.
DETAIL FIGURE 15
MONO STABLE RELAY DRIVER
DETAIL FIGURE 13
DETAIL FIGURE 10
DETAIL FIGURE 8
CASE 3 DUAL CIRCUITRY-SINGLE POINT FAIL ON CASE
DETAIL FIGURE 6
CASE 2 DUAL CIRCUITRY SINGLE POINT FAIL OFF CASE
DETAIL FIGURE 4
X=1 DESIGNATES C6A1 PANEL
X=2 DESIGNATES C6A2 PANEL
Y=M DESIGNATES MOMENTARY
Y=L DESIGNATES LATCH
Y=UL DESIGNATES UNLATCH
CASE 4 TRIPLE CIRCUITRY-OUTPUT FUNCTION RESPONDS CORRECTLY WITH SINGLE-POINT FAILURE.
DETAIL FIGURE 2
CASE 2 DUAL CIRCUITRY FUNCTION MUST FAIL OFF WITH SINGLE-POINT FAILURE.
COMMAND POWER TO INSTRUMENTATION UNIT
GSE ACCESS
CIRCUIT INTERRUPTER
MASTER CONTROL TRANSFER
DC RET
22 FOR CONTINUATION OF CIRCUITS SEE ME 453-0013-003
21 INDICATE THAT THE POINT IS THE SOURCE OF THE SIGNAL.
20 SIGNAL POINTS IDENTIFIED BY A LABEL & ASTERISK
19 FOR DETAIL SEE FIGURE 15
18 14
17 13
16 12
15 11
14 10
13 9
12 8
11 7
10 6
9 5
8 4
7 3
6 2
5 FOR DETAIL SEE FIGURE 1
4 FOR CONTINUATION OF DC GROUNDING SEE C7
3 FOR CONTINUATION OF DC POWER SEE C2
2. FOR CONTINUATION OF GSE CIRCUIT. SEE G14-900017, VOL I
1 FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS SEE INDICES
NOTES: UNLESS OTHERWISE SPECIFIED
Z2
DR BY FLEISCHER 6-18-65
CHK BY 697-406 3881
APPROVED BY
HOFFMAN 7/14/6
STEVENSON 7-16-6
SC017 DOWNEY
SC020 & ETR
NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION
12214 LAKEWOOD BLVD. DOWNEY CALIFORNIA
ACS-DETAIL OF CIRCUITRY SYMBOLS USED, 28V MAINS AND F&PL BUS GROUNDS AND PROG RESET
CODE IDENT NO 03953
SIZE J
V14-900017
REV D
SHEET 2.74
V14-900017 D



NOTES: UNLESS OTHERWISE SPECIFIED

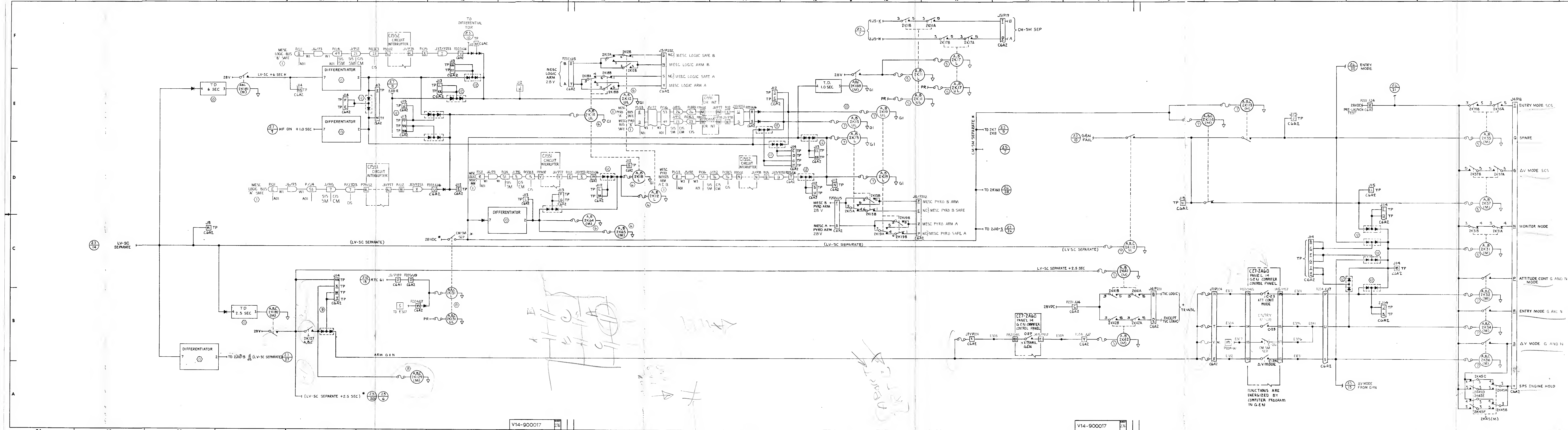
1. FOR ALL FLAG NOTES ⬡ SEE Z2

2 FOR CONTINUATION OF ALL SWITCHES DEVICES & RELATED CIRCUITS, SEE INDICES

Z3

DR BY	RALONG	10/27/5	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA
CHK BY	697-406	3881	
APPROVED BY			ACS-LIFTOFF, LV-SC SEPARATE & ABORT LOGIC
HOFFMAN	7/16/6		
STEVENSON	7-16-6		
SC017 SC020	DOWNEY & ETR		CODE IDENT NO 03953 · SIZE J · V14-900017
			SCALE · REV. D · SHEET 2, 75

V14-900017 D



2. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS, SEE INDICES

1. FOR ALL FLAG NOTES ⬡ SEE Z2

NOTES UNLESS OTHERWISE SPECIFIED

Z4

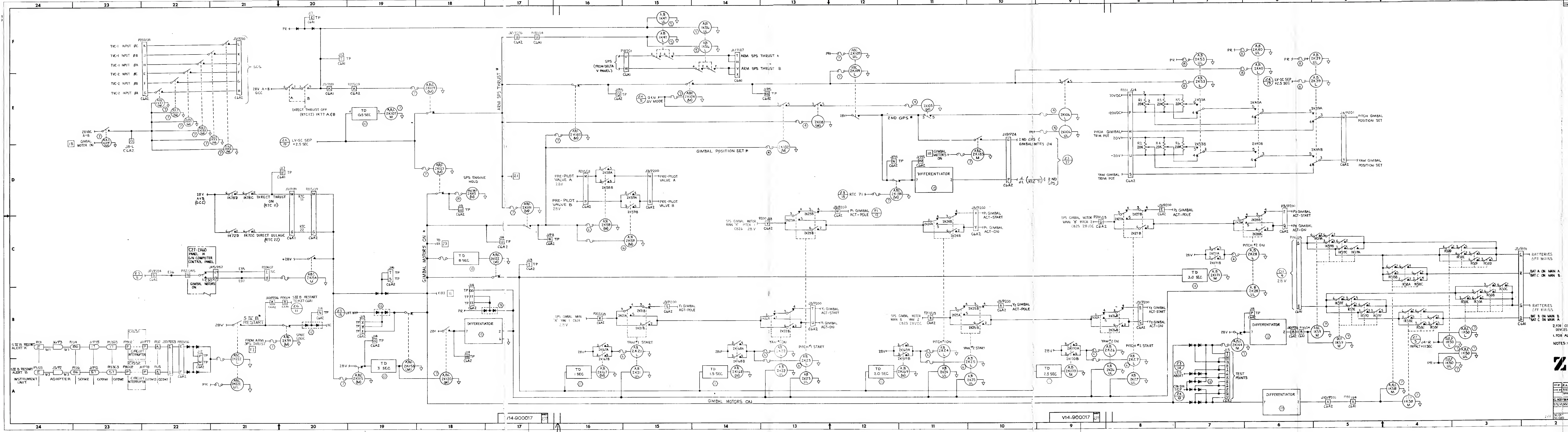
DR BY	JIM ELLIS	6-21-65
CHK BY	637-406	
APPROVED BY		
HOFFMAN	7/16/6	
STEVENSON		
SC017 SC020	DOWNEY & ETR	

NORTH AMERICAN AVIATION INC
SPACE and INFORMATION SYSTEMS DIVISION
12214 LAKEWOOD BLVD DOWNEY CALIFORNIA

ACS- LV-SC SEPARATE, MIDCOURSE LOGIC, & PYRO BUSES ARM

CODE IDENT NO	SIZE	
03953	J	V14-900017
SCALE	REV D	SHEET 2.76

V14-900017 D



NOTES: UNLESS OTHERWISE SPECIFIED

1. FOR ALL FLAG NOTES ⬡ SEE Z2

2. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS, SEE INDICES

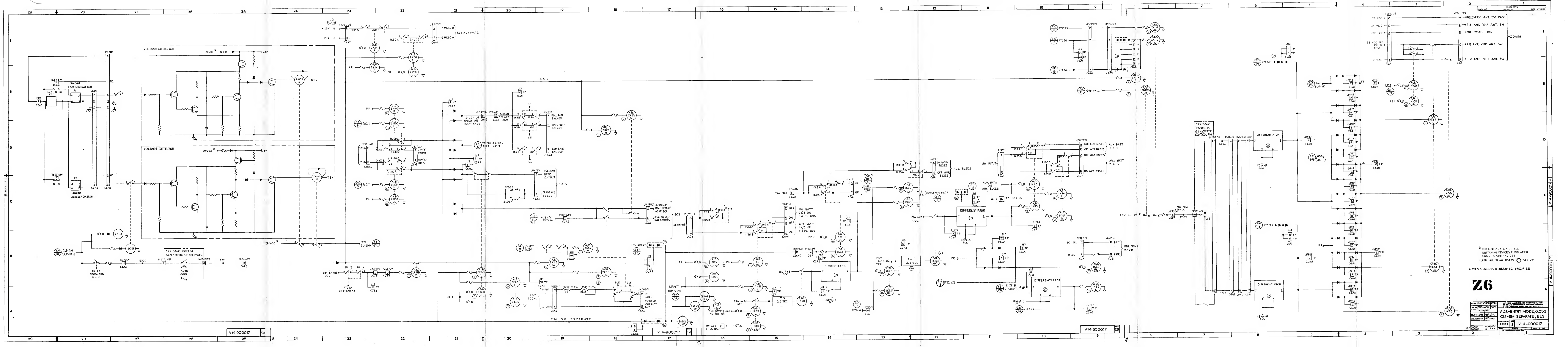
Z5

DR BY	R.A. LONG	6-14-65
CHK BY	697-406	3881
APPROVED BY		
G. HOFFMAN	7/16/6	
STEVENSON		
SC 01 SC 020	DOWNEY & ETR	

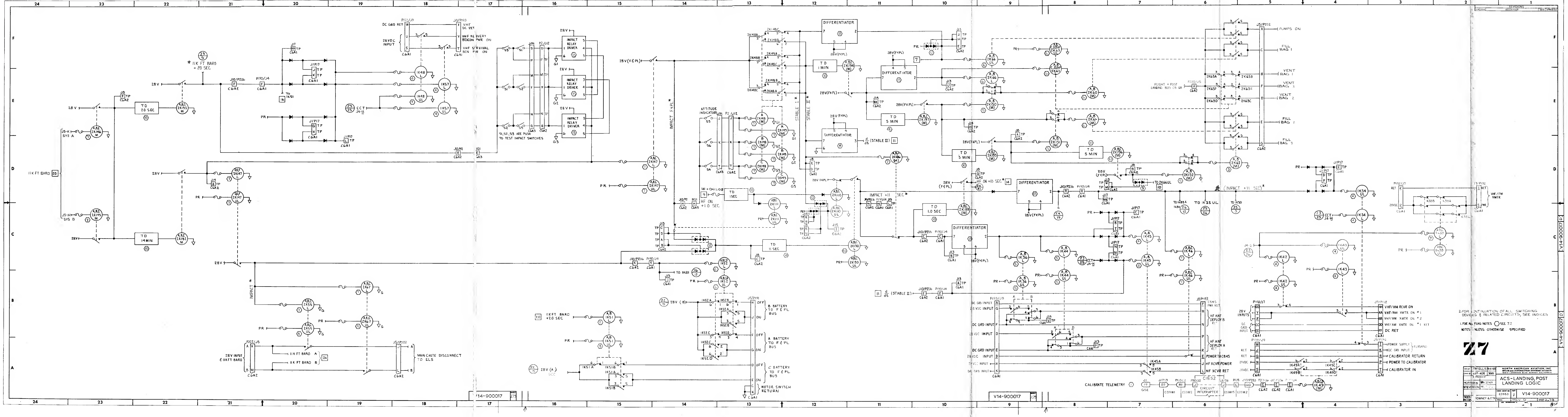
NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION
12214 LAKEWOOD BLVD. DOWNEY, CALIFORNIA

ACS-MIDCOURSE SPS, G&N LOGIC

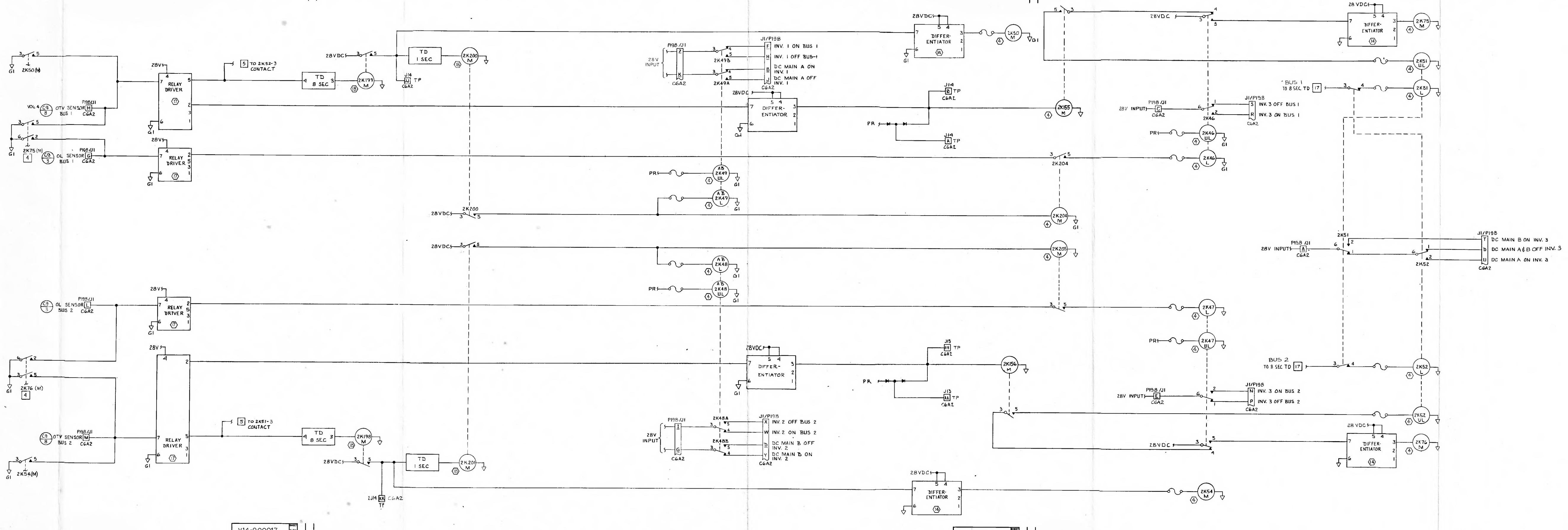
CODE IDENT NO	SIZE	
03953	J	V14-900017
SCALE	REV D	SHEET 2.77



VOLTAGE DETECTOR
VOLTAGE DETECTOR
LINEAR ACCELEROMETER
CM-SM SEPARATE
DIFFERENTIATOR
DIFFERENTIATOR
DIFFERENTIATOR
DIFFERENTIATOR
DIFFERENTIATOR
AUX BUSES
COMM
NOTES : UNLESS OTHERWISE SPECIFIED
Z6
NORTH AMERICAN AVIATION, INC.
ACS-ENTRY MODE, 0.05G
CM-SM SEPARATE, ELS
DR BY FLEISCHER 8/2/65
CHK BY 697-406 3881
APPROVED BY
HOFFMAN
STEVENSON
SC017
SC020
DOWNEY & ETR
CODE IDENT NO 03953
SIZE J
V14-900017
REV D



DIFFERENTIATOR
TD 20 SEC
TD 14 MIN
TD 1 MIN
TD 5 MIN
TD 10 SEC
TD 15 SEC
IMPACT RELAY DRIVER
ATTITUDE INDICATOR
PUMPS ON
FILL BAG 1
VENT BAG 1
VENT BAG 2
FILL BAG 2
FILL BAG 3
MAIN CHUTE DISCONNECT TO ELS
B BATTERY TO F C PL BUS
A BATTERY TO F C PL BUS
C BATTERY TO F C PL BUS
MOTOR SWITCH RETURN
CALIBRATE TELEMETRY
CIRCUIT INTERRUPTER
2. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS, SEE INDICES
1. FOR ALL FLAG NOTES SEE Z2
NOTES UNLESS OTHERWISE SPECIFIED
Z7
DR BY JIM ELLIS 8-4-65
CHK BY 697-406 3881
APPROVED BY
HOFFMAN
STEVENSON
NORTH AMERICAN AVIATION, INC
SPACE and INFORMATION SYSTEMS DIVISION
12214 LAKEWOOD BLVD DOWNEY CALIFORNIA
ACS-LANDING, POST LANDING LOGIC
CODE IDENT NO 03953
SIZE J
V14-900017
SCALE
REV D
SHEET 2.79



2. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS, SEE INDICES
1. FOR ALL FLAG NOTES ⬡ SEE Z2

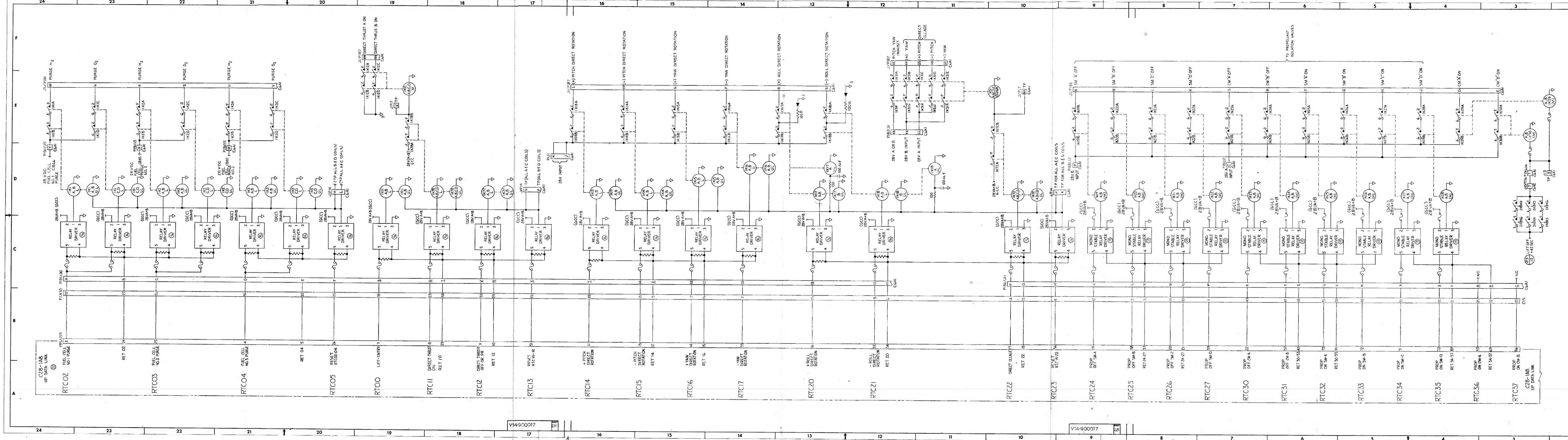
NOTES: UNLESS OTHERWISE SPECIFIED

Z8

DR BY	FLEISCHER	7-23-5	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA
CHK BY	697-406	3881	
APPROVED BY			ACS-OVERLOAD AND OUT OF TOLERANCE VOLTAGE SENSORS
HOFFMAN	7/16/6		
STEVENSON	7-16-6		
SC017 SC020	DOWNEY & ETR		CODE IDENT NO 03953 · SIZE J · V14-900017
			SCALE · REV D · SHEET 2.80

V14-900017 D

V14-900017



2 FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS SEE, INDICES

1. FOR ALL FLAG NOTES ⬡ SEE Z2

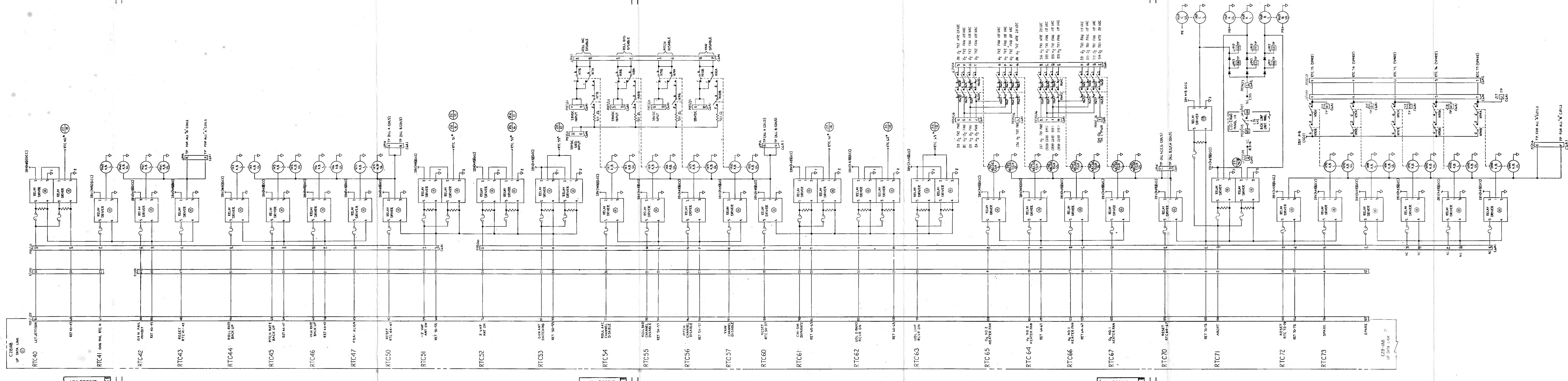
NOTES: UNLESS OTHERWISE SPECIFIED

Z9

DR BY	BRENNEMAN	8-3-65	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION 12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA
CHK BY	697-406	3881	ACS-REAL TIME COMMANDS RTC 02-37
APPROVED BY			
HOFFMAN	7/16/6		
STEVENSON			
SC017 SC020	DOWNEY & ETR		CODE IDENT NO 03953 — SIZE J — V14-900017
			SCALE — REV D — SHEET 2.81

V14-900017 D

13



2. FOR CONTINUATION OF ALL SWITCHING DEVICES & RELATED CIRCUITS, SEE INDICES

1. FOR ALL FLAG NOTES SEE Z2

NOTES: UNLESS OTHERWISE SPECIFIED

Z10

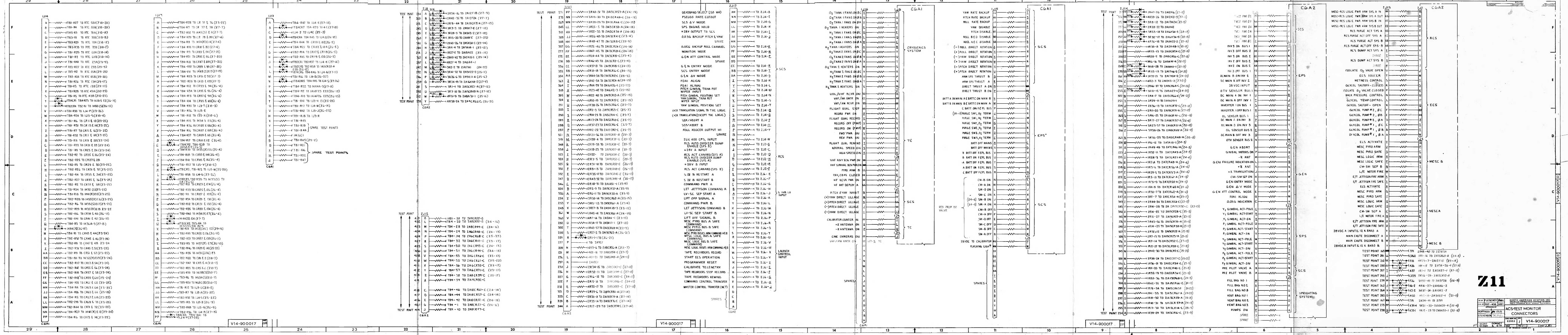
DR BY	HUMPHREY	7-29-66
CHK BY	697-406	3881
APPROVED BY		
HOFFMAN	7/16/6	
STEVENSON	MCS 7-16-6	
SC017 SC020	DOWNEY & ETR	

NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION
12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA

ACS-REAL TIME COMMAND RTC 40-77

CODE IDENT NO 03953 | SIZE J | V14-900017

SCALE | REV D | SHEET 2.82



CGA1
CGA2
CRYOGENICS SYSTEM
SCS
TC
EPS
ECS
GEN
MESC B
MESC A
RCS
LAUNCH CONTROL INPUT
UPRIGHTING SYSTEM
SPARES
TEST POINT
Z11
V14-900017
DR BY FLEISCHER
CHK BY 697-406 3881
APPROVED BY
HOFFMAN
STEVENSON
SC017
SC020
DOWNEY & ETR
NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION
12214 LAKEWOOD BLVD., DOWNEY, CALIFORNIA
ACS-TEST MONITOR CONNECTORS
CODE IDENT NO 03953
SIZE J
V14-900017
SCALE
REV: D
SHEET 2,83